

# COMMERCIAL FISHERIES REVIEW



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## COMMERCIAL FISHERIES REVIEW



A REVIEW OF DEVELOPMENTS AND NEWS OF THE FISHERY INDUSTRIES  
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### CONTENTS

COVER: USE OF TELEVISION TO ADVERTISE FISH AND SHELLFISH PRODUCTS HAS GAINED IN POPULARITY IN THE PAST YEAR. THE COVER PICTURE SHOWS A SCENE IN A MORNING TELEVISION PROGRAM WHICH EMANATES DAILY FROM A WASHINGTON, D. C., STATION. THE PROGRAM POINTS OUT GOOD BUYS IN FOOD. FISHERY PRODUCTS HAVE BEEN FEATURED QUITE OFTEN. NOTE FISH FILLETS WHICH ARE BEING SHOWN TO TV AUDIENCE. (SEE P. 34 OF THIS ISSUE.)

	PAGE
EXPLORATORY SHRIMP FISHING IN THE GULF OF MEXICO, 1950-51 (PROGRESS REPORT), BY STEWART SPRINGER AND HARVEY R. BULLIS .....	1
INCREASING THE SPREAD OF SHRIMP TRAWLS, BY CARL B. CARLSON .....	13

	PAGE		PAGE
RESEARCH IN SERVICE LABORATORIES: .....	16	TRENDS AND DEVELOPMENTS (CONTD):	
TECHNICAL NOTE NO. 21--EQUIPMENT AND PROCEDURE FOR THAWING FISH FROZEN AT SEA, BY H. W. MAGNUSSON .....	18	SERVICE BIOLOGIST ACCOMPANIES JAPANESE SALMON-FISHING EXPEDITION .....	30
TECHNICAL NOTE NO. 22--FISH FROZEN IN BRINE AT SEA: PRELIMINARY LABORATORY AND TASTE-PANEL TESTS, BY S.R. POTTINGER, JOHN HOLSTON, AND GRACE MCCORMACK .....	20	SHRIMP EXPLORATIONS OFF THE CARIBBEAN COASTS OF HONDURAS AND NICARAGUA .....	31
TRENDS AND DEVELOPMENTS: .....	24	WHOLESALE AND RETAIL PRICES:	
ADDITIONS TO THE FLEET OF U. S. FISHING VESSELS .....	24	WHOLESALE PRICES, MAY 1952 .....	32
CALIFORNIA SARDINE CATCH FOR 1951-52 SEASON .....	24	RETAIL PRICES, MAY 1952 .....	33
CALIFORNIA TAGS TUNA WITH EXPERIMENTAL-TYPE TAGS .....	25	FOREIGN: .....	35
CALIFORNIA FISHERMEN OBTAIN LICENSES FOR SHRIMP FISHING .....	26	ARGENTINE REPUBLIC:	
FEDERAL PURCHASES OF FISHERY PRODUCTS .....	27	WHALING FACTORYSHIP PURCHASED BY GOVERNMENT .....	35
METAL CANS--SHIPMENTS FOR FISHERY PRODUCTS, APRIL 1952 .....	27	CANADA:	
NEW ENGLAND TUNA EXPLORATIONS: MARJORIE PARKER TRIES OUT LONG-LINE GEAR (FISHING CRUISE NO. 1) .....	27	REVIEW OF THE FISHERIES, 1951 .....	35
NORTH ATLANTIC FISHERY INVESTIGATIONS: LARGER-MESH NETS TESTED .....	28	NEWFOUNDLAND FISHERIES PLANS AND PROSPECTS .....	36
PACIFIC HALIBUT AREAS 3A AND 1A CLOSED .....	29	CHILE:	
PACIFIC OCEANIC FISHERY INVESTIGATIONS: NEW EASTERN PACIFIC TUNA GROUNDS DISCOVERED .....	30	MARINE OIL PRODUCTION, 1951 .....	37
		DENMARK:	
		BROOK TROUT EXPORTS, 1951 .....	37
		ECUADOR:	
		TERRITORIAL WATERS DEFINED .....	37
		INDIA:	
		PEARL FISHING TO BE REVIVED BY MADRAS .....	38
		JAPAN:	
		MOTHERSHIP-TYPE TUNA EXPEDITIONS TO OPERATE IN EQUATORIAL WATERS .....	38
		GOVERNMENT RESTRICTIONS ON TUNA FISHING IN THE PACIFIC OCEAN .....	38
		CANNED TUNA CHECK PRICES REVISED .....	39

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## EXPLORATORY SHRIMP FISHING IN THE GULF OF MEXICO, 1950-51 (Progress Report)

By Stewart Springer\* and Harvey R. Bullis\*\*

### INTRODUCTION

Shrimp exploration received the major emphasis in activities of the exploratory fishing vessel Oregon, operated by the Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, since July 1950. The purpose of the explorations during the latter half of 1950 and in 1951 was to locate concentrations of marketable shrimp outside the range of the existing fishery, to outline the extent of good shrimp-fishing areas and the seasons of best fishing in these areas, and to adapt or develop practical gear designs and methods to meet any new conditions found. The emphasis on shrimp exploration and shrimp-gear studies followed the recommendations of the Gulf States Marine Fisheries Commission, but secondary projects also were undertaken and will be reported separately.

Many considerations influenced the plans of the operation. The first objective was to explore as wide an area of the Gulf of Mexico as possible and to work intensively only in the areas that seemed to offer promising possibilities for immediate commercial exploitation. During this period of preliminary coverage it was economical and expedient to obtain as much exploratory data as possible not only on shrimp but on other potential fishery resources as well.

This is consistent with the long-range program for investigation of the fishery

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NOTE: THIS ARTICLE AS IT APPEARS HERE PLUS A DETAILED FISHING LOG (WHICH DOES NOT APPEAR HERE), ALSO IS AVAILABLE AS FISHERY LEAFLET 406.



FIG. 1 - M/V OREGON, EXPLORATORY FISHING VESSEL OPERATED IN THE GULF OF MEXICO BY THE SERVICE'S BRANCH OF COMMERCIAL FISHERIES.

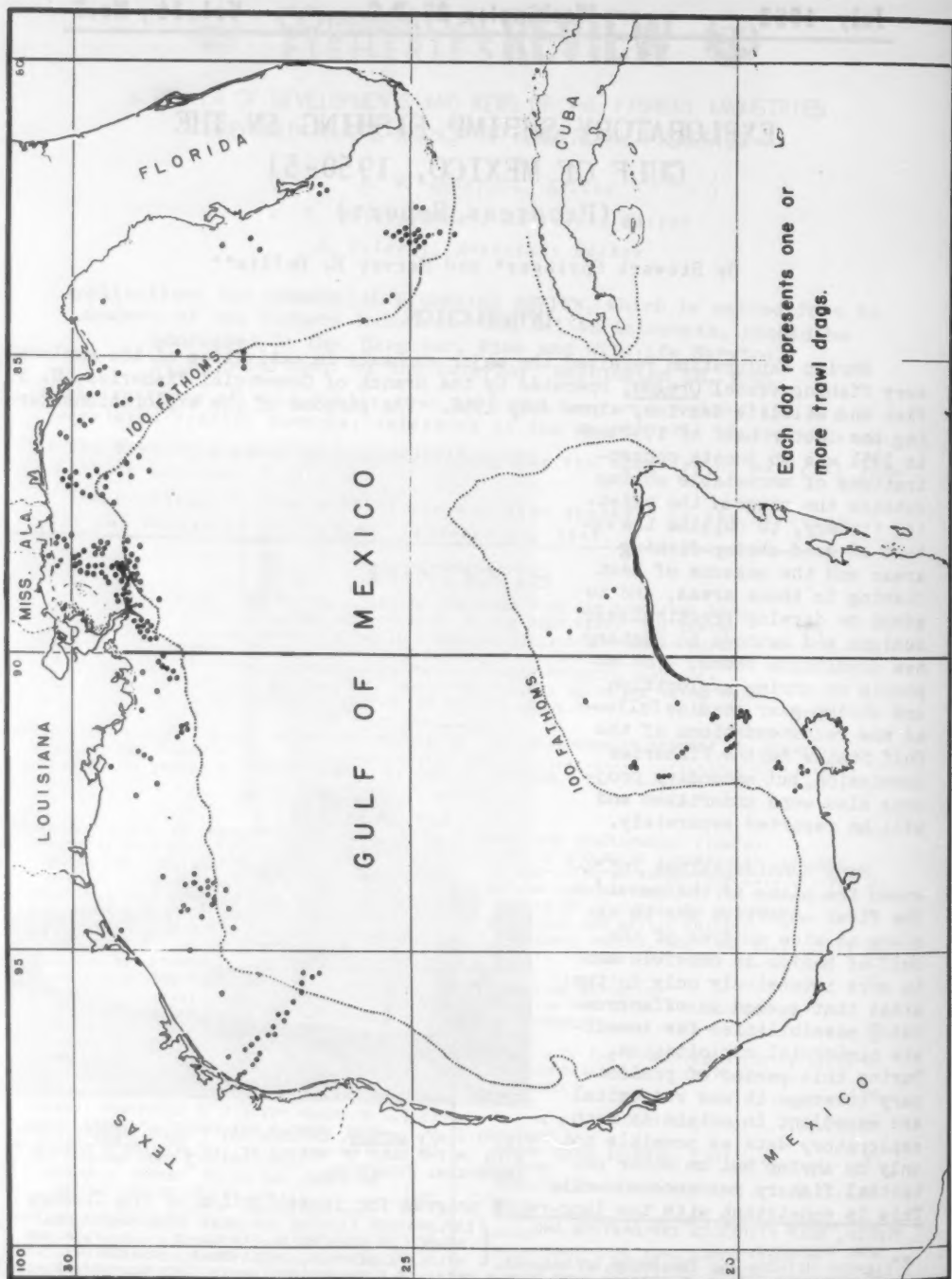


FIG. 2 - DISTRIBUTION OF 1950-51 TRAWLING OPERATIONS BY THE GULF OF MEXICO.



resources of the Gulf. An important part of the results of the explorations is the basic information assembled, which will facilitate planning future effective exploratory work.<sup>1/</sup> Snapper-fishing spots have been included because, in general, these are rocky or coral-covered locations where shrimp trawling would probably result in lost gear. These locations should be avoided by shrimp trawlers. On the other hand, snapper-fishing spots frequently mark the location of "lumps" or small seamounts where repeated observations have shown that surface-feeding fish, such as little tuna, congregate, and which consequently might be expected to be better than average places for trolling or gill-netting surface fish.

A brief account of recent developments in the Gulf of Mexico shrimp fishery and a descriptive summary of initial Gulf explorations by the Oregon have been given by Springer (1951a and 1951b). The purpose of this report is to outline the progress made in shrimp exploration and summarize the data obtained. Separate reports will be made of explorations for other fishery resources.

#### GEOGRAPHICAL AND SEASONAL DISTRIBUTION OF EXPLORATION

The 1950-51 explorations covered the major areas of potential shrimp-trawling bottom in the Gulf. However, the drags were widely separated both as to geographical position and season. Unworked grounds near the principal regions of



FIG. 3 - TWO LARGE LOGGERHEAD SPONGES FROM OREGON STATION 232. THIS SPECIES IS COMMON ALL ALONG THE FLORIDA WEST COAST AND CONSTITUTES ONE OF THE MAJOR TRAWLING HAZARDS IN THAT AREA. <sup>1/</sup>AN ILLUSTRATION OF THE WAY IN WHICH INFORMATION COLLECTED DURING ONE TYPE OF FISHING CAN BE USED IN ANOTHER IS CONTAINED IN THE FISHING LOG (TABLE 1). THE FISHING LOG (TABLE 1) IS NOT INCLUDED HERE, BUT APPEARS AS AN APPENDIX TO THE FISHERY LEAFLET (NO. 406) ISSUE OF THIS REPORT.

shrimp production received special attention. Much of the available time was devoted to work near (but outside) the known shrimp grounds off the mouth of the Mississippi River, off the Texas coast, near Dry Tortugas, and in the Gulf of Campeche. Although the distribution of exploratory drags was extensive (see fig. 2), large areas received scanty coverage. In general, these areas are difficult to work either because they are remote from fishing ports or because the nature of the bottom causes excessive loss to conventional trawling gear. The use of special gear, which has now been developed, is expected to facilitate the exploration of rough bottom during 1952. This gear consists chiefly of small, inexpensive, and expendable nets and dredges to be used in connection with bottom samplers for the first examination of unknown bottoms. It is expected that adaptations of mud ropes, rollers, bottomless nets, and other devices to full-size commercial gear can then be tried in selected areas without excessive loss.

Drags were made by the Oregon in depths up to 500 fathoms, but the greatest number were made in the 20- to 60-fathom range. A large number of drags were made at night because catches of grooved shrimp are generally larger at night. Cruise plans for exploration in 1952 call for fishing in various parts of the Gulf at times that should give more information on seasonal changes in conditions.

#### GEAR USED

Several types of trawls were used by the Oregon in the shrimp-exploration program, and most of the commonly accepted designs were tried on a variety of bottom conditions, employing many minor modifications in rigging. Some of these trawls are described by Bullis (1951). Trawls were obtained from various trawl makers in the Gulf area or were built by the netmen aboard the vessel. Standard 8-foot to 12-foot try nets were used at the beginning of the exploratory-fishing program, but since the relationship of results with the try nets and with the larger nets seemed to be particularly difficult to establish, the try nets were subsequently used only to secure unrecorded additional information while working with larger nets.

A 40-foot flat trawl was used chiefly for first trials on unknown bottom. This net has been extremely valuable both for its simple construction and good fishing ability. From time to time other styles of nets were reduced in size to 40-foot models and used for this purpose, with somewhat less desirable results. A 40-foot balloon trawl was found to consistently "choke-off" at the throat, building up the catch in the body of the trawl and then tearing through the lighter webbing. By changing body tapers and wing designs this could be corrected; but it was observed that as the design improved it rapidly lost its identity as a balloon trawl and assumed many of the differentiating characteristics of the flat trawl. This same tendency has been noted in experimental designs which have been tried throughout the past year.

When good shrimp-fishing grounds were located and fairly good bottom was encountered, drags were made with the larger, standard trawls. A 100-foot flat trawl, a 74-foot balloon trawl, and a 65-foot wedge-shaped flat trawl were used in this way after August 1950. The catches from this gear gave a fairly accurate picture of what commercial boats might be expected to catch if fishing on the grounds. The different-style trawls were used to see if there was a noticeable difference in catch rate and to find out if one type was more suited to work a particular kind of bottom. Attempts to select the best "catcher" have been inconclusive. In the areas of very good fishing, such as the Dry Tortugas grounds, there was no appreciable difference between the 74-foot balloon trawl and the 100-foot flat trawl in pounds of shrimp per hour. The balloon trawl caught more trash fish and less bottom "trash," such as shells and sponge, and the catch of shrimp was generally in better condition than catches taken by the flat trawl.

Comparisons of the effectiveness of nets are very difficult to make even when most of the factors of difference can be determined. For example, several comparative pairs of drags were made in the same place, using a 40-foot flat trawl and a 100-foot flat trawl. The 40-foot net caught approximately two-fifths as much material in 30 minutes as the 100-foot net caught in 30 minutes. But since the vessel traveled 2 nautical miles dragging the 40-foot trawl for 30 minutes and only  $1\frac{1}{4}$  miles dragging the 100-foot trawl for 30 minutes, the convenient relation established between the two sizes appears to be coincidental. Since 4 knots is the slowest practical speed for the Oregon with a 40-foot net, a reduction in speed could be made only with an additional drag against the vessel. Operating two 40-foot nets at the same time from opposite sides of the vessel was tried, and it worked satisfactorily. Comparison of the effectiveness of nets, however, have not been made in sufficient number to permit evaluation of the various rigs. Each rig combination (net, doors, cables, and boat) not only has an optimum working speed but is selective to a considerable degree. Trawling is often prevented by such obstacles as sharp coral, heavy growths of loggerhead sponges and shell, and soft mud which quickly bogs the trawl and doors. Even exploratory sampling was not feasible over coral and loggerhead-sponge bottom because of gear losses. Several variations of a bottomless trawl were made for the loggerhead-sponge area off the Florida coast and in first tests the new design eliminated up to 95 percent of the sponges. A series of comparative drags made in the Campeche area in August 1951 showed that the bottomless net caught slightly fewer shrimp, but the catch was nearly free of bottom "trash." Gear experimentation will be continued in 1952.

#### DRAGGING DATA AND SHRIMP-FISHING METHODS

At the start of the explorations for shrimp, a standardized procedure was set up for recording data. A fishing log has been extracted from these data to give a summary of each major shrimp-dragging operation. As the work progressed, new problems appeared requiring more or different information about the results of the drags. A complete tabulation of data is beyond the scope of this report, but pertinent information will be summarized in a final report.

Charts made by recording echo depth sounders illustrate some of the bottom conditions encountered by shrimp trawlers. Charts A and B in figure 4 show extremes in irregularity of soft-mud bottom near the mouth of the Mississippi River. Large catches of white shrimp are made by the shrimp fleet in the vicinity of these mud lumps, but a great amount of gear is lost by bogging in attempts to make drags in the areas where the irregularities are most pronounced. Charts C and D in figure 4 are characteristic of the "edge" where slopes of the continental shelf are steep. Frequently the "edge" is rocky, and the pinnacle (station 174, shown in chart C, figure 4) is coral-covered and a fair location for red-snapper fishing. A drag made over relatively smooth bottom with a steep slope (shown in chart D, figure 4) was unsuccessful because the net was overturned and twisted, evidently by the irregular currents in the vicinity. A drag made in a similar situation nearby loaded up with shell and heart urchins, resulting in damage to the net. Very often the irregularities in the bottom are noticed on the depth-sounder chart in time to save gear from damage by obstructions. Chart A of figure 5 shows an obstruction at the right of the center which was not noticed in time, and a part of a trawl was lost at that point (station 145). The differences between good trawling bottom and poor trawling bottom are not always apparent on depth-sounder charts. Chart B in figure 5 shows good trawling bottom while the similar-appearing bottom in chart C was covered with fine spikes of coral, which shredded nets in a very short time. The interference represented by a roundish area just above the bottom line in chart D in figure 5 probably is produced by shrimp or fish. The interpretation of depth-sounder interference patterns requires practice and a

wealth of experience that permits verification of the interpretation by catching the fish or at least by seeing them. In one instance, near Dry Tortugas, the appearance of the depth-sounder chart suggested that the Oregon was running at full speed onto an uncharted shoal, although the sounding lead showed 9 fathoms. Schools of herring-like fishes were seen soon after, but specimens could not be taken. This is as near as we have come to the identification of fish as a cause for depth-sounder interference in the Gulf.

At the beginning of the shrimp exploration little equipment was on hand for a detailed survey of bottom conditions for shrimp and shrimp trawling. Work on this has been started and will be reported in the future.

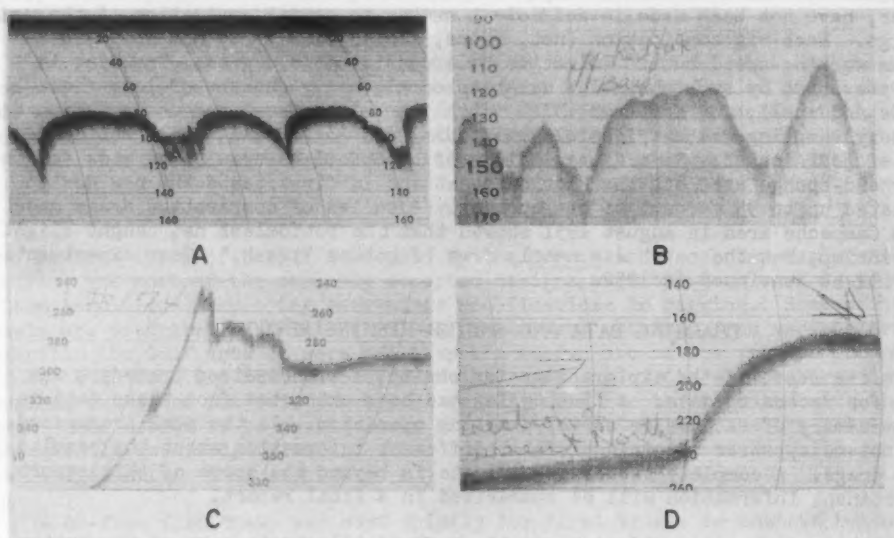


FIG. 4 - ECHO DEPTH RECORDER CHARTS SHOWING BOTTOM TYPE AND CONTOUR. SOUNDINGS ARE IN FEET.

- A - "MUD LUMP" AREA OFF THE MISSISSIPPI DELTA. BOTTOM IS SOFT MUD.
- B - ANOTHER "MUD LUMP" RECORDING IN DEEPER WATER OFF REDFISH BAY.
- C - A BOTTOM SECTION OF THE "EDGE" AT OREGON STATION 174. THE PINNACLE IS CORAL COVERED AND ROCKY.
- D - AN ABRUPT SLOPE CHARACTERISTIC OF THE "EDGE." ALTHOUGH NOT IN EVIDENCE THERE IS SOME CORAL PRESENT. RED SNAPPERS WERE TAKEN AT THE POINT MARKED BY THE ARROW IN THE UPPER RIGHT CORNER.

An important part of the exploratory-fishing data has been secured through the assistance of cooperators from institutions interested in the general program of Gulf fisheries research. The value of the cooperative study may be expected to be more apparent in subsequent and final reports where results of different lines of investigation are fitted together.

#### SOME OBSERVATIONS ON THE OREGON FISHING LOG, 1950-51

Summaries of information taken from the fishing logs of the Oregon will be given in a final report on shrimp exploration to be published later.

Most of the drags made had some kind of penaeid shrimp in the catch, but only species of commercial interest were shown in the log. Nineteen species were



identified from Oregon collections by M. D. Burkenroad, Institute of Marine Science of the University of Texas, or by F. A. Chace, Jr., Curator of Marine

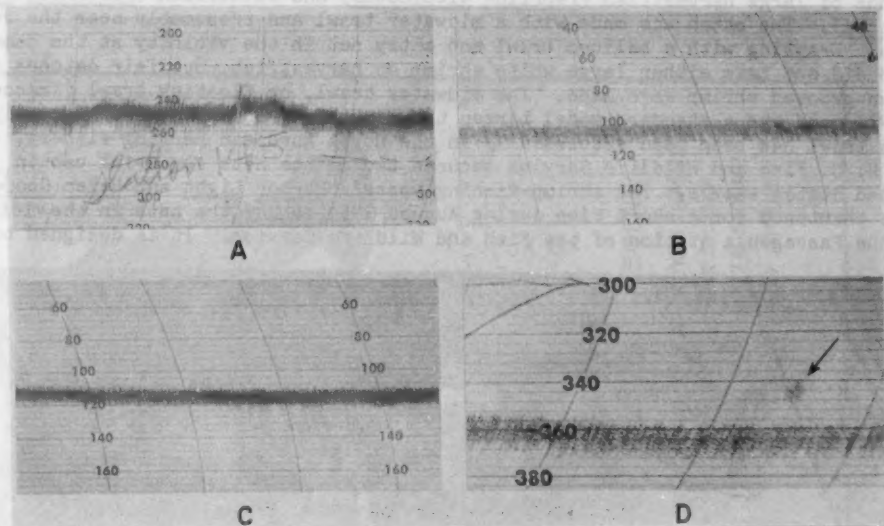


FIG. 5 - ECHO DEPTH RECORDER CHARTS SHOWING BOTTOM TYPE AND CONTOUR. SOUNDINGS ARE IN FEET.

- A - OREGON STATION 145. THE OBSTRUCTION AT RIGHT OF CENTER TORE OFF THE LEAD LINE AND TRAWL BODY. BOTTOM IS HARD MUD AND SAND.
- B - OREGON STATION 291. THIS SHOWS GOOD TRAWLING CONDITIONS OF SMOOTH BOTTOM AND SLIGHT SLOPE. BOTTOM IS GRAY MUD.
- C - OREGON STATION 223. HERE THE BOTTOM LOOKS AS GOOD AS IT DOES IN B BUT IS COVERED WITH SMALL FINGERS OF LIVING CORAL. TRAWLING IN THIS AREA WITH CONVENTIONAL SHRIMPING GEAR IS EXTREMELY HAZARDOUS.
- D - OREGON STATION 331. A RECORDING SHOWING AN INTERFERENCE SPOT, PROBABLY A SCHOOL OF FISH OR SHRIMP CLOSE TO THE BOTTOM.

Invertebrates, United States National Museum. It is probable that additional species will be identified from collections already made or from subsequent collections.

**WHITE SHRIMP:** The white shrimp, *Penaeus setiferus*, is usually taken by the fishery inside the 20-fathom curve by trawling during daylight hours. Because of its inshore range, the species has been of only incidental interest in the exploration. The three instances appearing in the fishing log of the capture of specimens of the white shrimp outside their usual depth range (43 fathoms, stations 340 and 342) or geographical range (station 237 near Dry Tortugas) are probably not indications of the existence of stocks of commercial interest in the vicinity.



FIG. 6 - DUMPING THE CATCH ON THE DECK OF THE OREGON DURING NIGHT FISHING.



A catch of  $4\frac{1}{2}$  pounds of large white shrimp was made at night on August 15, 1951, in  $7\frac{1}{2}$  fathoms off Chandeleur Islands, Louisiana, along with several hundred pounds of large harvestfish (Peprilus alepidotus) and butterfish (Poronotus triacanthus). The catch was made with a midwater trawl and presumably near the surface. Dragging with a balloon trawl and a try net in the vicinity at the same time did not take either large white shrimp or harvestfish, but fair catches of brown-grooved shrimp were made. The midwater trawl, or floating trawl (Krason 1949), used was a standard-model Larsen trawl obtained from Denmark. Recently this trawl has been used successfully in the north European herring fishery, and the U. S. Fish and Wildlife Service secured two of the nets for trial use in United States waters. The shrimp-fishing vessels Harbor Light and Helen Cooper were chartered for a short time during August 1951 to try the nets in the vicinity of the Pascagoula station of the Fish and Wildlife Service. It is designed to

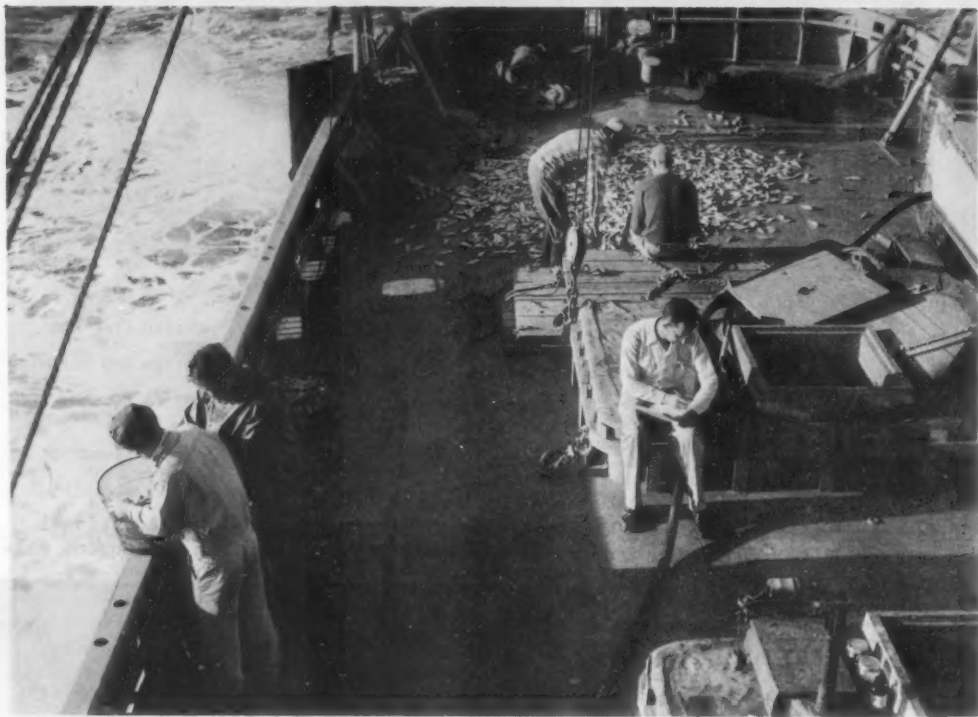


FIG. 7 - SORTING, WEIGHING, COUNTING, AND RECORDING THE CATCH ABOARD THE OREGON.

work above the bottom without doors. Two boats are required to pull the net, each boat handling a pair of cables, one to the float line, and the other to the lead line. The depth at which the net works is adjusted by the speed of the vessels and length of the towing cables. The first net tried at Pascagoula was of relatively fine mesh, with both vertical and horizontal spread of 48 to 52 feet. Setting and hauling was accomplished without great difficulty, but it was found that the net was too large to maneuver properly with the power available (165 horsepower in each boat), and a speed of  $2\frac{1}{2}$  to 3 knots was all that could be reached. A smaller net with a 36- to 38-foot opening was constructed. Funds were available for only one day's trial of this net, but results were better than with the larger net, and speeds of from 5 to 7 knots were attained, as well as better maneuverability.

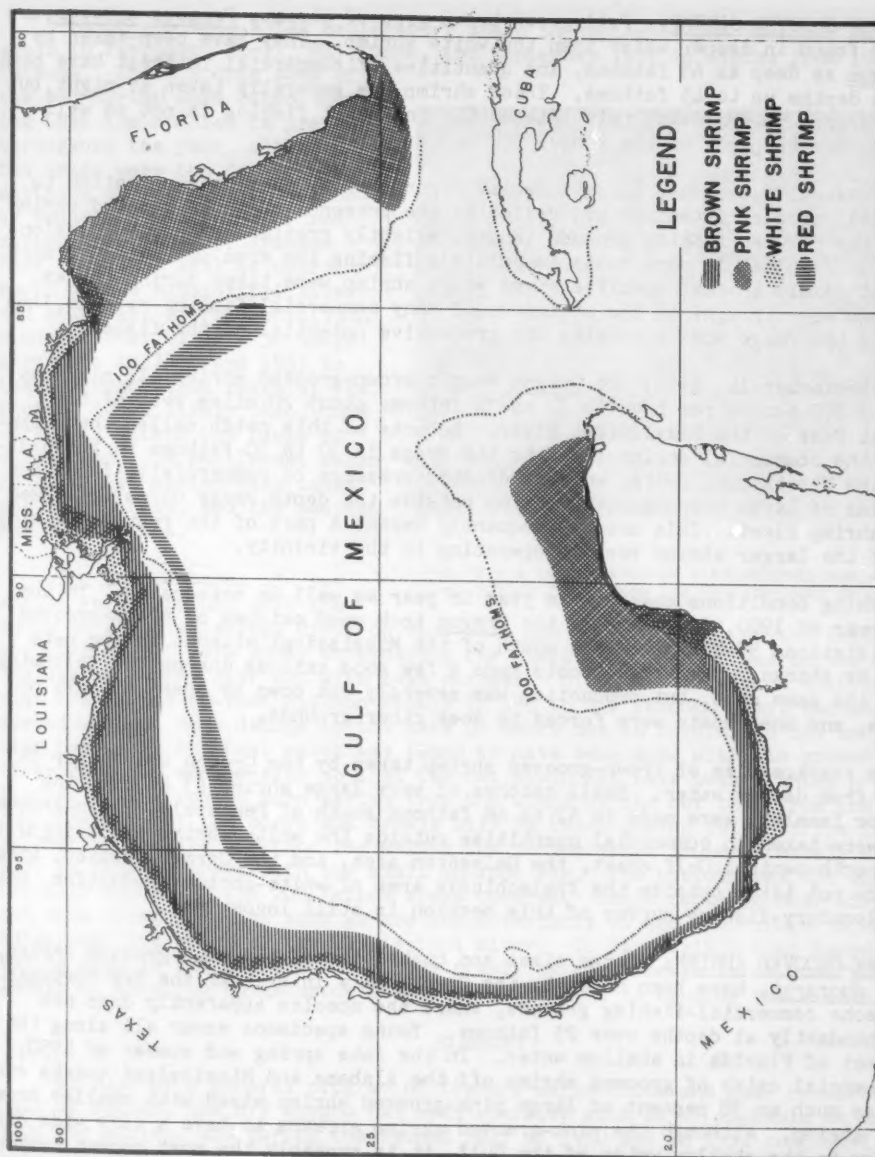


FIG. 8 - COMPOSITE CHART SHOWING KINDS OF MARKETABLE-SIZE SHRIMP MOST COMMON TO EACH GULF AREA. THE RANGES OF SOME SPECIES OVERLAP, AND COMMERCIALLY-IMPORTANT QUANTITIES DO NOT OCCUR THROUGHOUT THE RANGE OF ANY OF THESE SPECIES. (BASED ON DATA FROM ALL AVAILABLE SOURCES.)

No indication of its effectiveness for shrimp was obtained because the few sets were made on schools of fish and were carried out to get preliminary data on the operation of the gear. Further trials of the gear by the Service are planned in the near future.

**BROWN-GROOVED SHRIMP:** Full-grown brown-grooved shrimp, Penaeus aztecus, are commonly found in deeper water than the white shrimp. They have been taken by the Oregon as deep as 68 fathoms, and quantities of commercial interest have been found in depths up to 45 fathoms. These shrimp are generally taken at night, but the difference in the catch rate between day and night fishing is not so well marked in deeper parts of the range.

On several occasions, through cruise reports or by radio communication to commercial vessels, attention was called to the presence of brown-grooved shrimp outside the regular fishing grounds (and in slightly greater depths). Occasionally, this resulted in some boats immediately fishing the area indicated. A more important result is that specific areas where shrimp were taken during the explorations were brought to the attention of many commercial fishing vessels, thus extending the range and increasing the productive potential of the fishery.

On September 14, 1950, the Oregon caught brown-grooved shrimp all night at a rate of 270 pounds per hour in 32 to 34 fathoms about 20 miles west of the Southwest Pass of the Mississippi River. Reports of this catch called the attention of the commercial shrimp fleet to the drags in 30 to 50 fathoms in the vicinity of the Mississippi delta, which indicated presence of commercially-important quantities of large brown-grooved shrimp outside the depth range normally worked by the shrimp fleet. This area subsequently became a part of the regular fishing range of the larger shrimp vessels operating in the vicinity.

Fishing conditions change from year to year as well as seasonally. In the late summer of 1950, for example, the Oregon took good catches of brown-grooved shrimp (stations 95-112) near the mouth of the Mississippi without having nets damaged by sharks. Commercial boats made a few good catches during the following fall in the same spot, but production was severely cut down by shark attacks on the nets, and most boats were forced to seek other grounds.

The average size of brown-grooved shrimp taken by the Oregon was larger in catches from deeper water. Small catches of very large shrimp (3 or 4 to the pound for females) were made in 52 to 68 fathoms south of Pensacola. Brown-grooved shrimp were taken in commercial quantities outside the white-shrimp producing areas of the north-central Gulf coast, the Galveston area, and the Carmen, Mexico, area. They were not taken outside the Apalachicola area of white-shrimp production, but the exploratory-fishing survey of this section is still incomplete.

**PINK-GROOVED SHRIMP:** Large sizes and quantities of the pink-grooved shrimp, Penaeus duorarum, have been taken by the Oregon only in or near the Dry Tortugas or Campeche commercial-fishing grounds, where the species apparently does not occur abundantly at depths over 25 fathoms. Young specimens occur all along the west coast of Florida in shallow water. In the late spring and summer of 1950, the commercial catch of grooved shrimp off the Alabama and Mississippi coasts contained as much as 30 percent of large pink-grooved shrimp mixed with smaller brown-grooved shrimp. Although the pink-grooved shrimp appears to have a very wide distribution in the shallow water of the Gulf, it is probably the most common commercial species only in the east Gulf from Apalachee Bay to Campeche Bay. Its presence in quantities of value to the commercial fishery in the northern parts of the Campeche Bank and off the west coast of Florida north of the Dry Tortugas grounds is possible, but exploration has not yet shown good results in these areas.

**RED SHRIMP:** Red shrimp, *Hymenopenaeus robustus*, were taken by the Oregon in August 1950 in 195 fathoms and 232 fathoms, using a 40-foot shrimp trawl put out on a single trawling cable with a bridle. The shrimp were taken in quantities which indicated that commercial operation might prove feasible, provided larger size nets could be used successfully in the deep water.

The Oregon made a few exploratory drags in September and November 1950 and again in February, April, May, June, and September 1951 in depths from 190 to 240 fathoms. In each drag some of the red shrimp were taken, showing that the species is present throughout the year, although the drags were too few to show anything about relative seasonal abundance. Catches of red shrimp were made off Aransas Pass, Tex., as well as near the mouth of the Mississippi River and southeast of Pensacola, Fla. Since a total of only 30 drags were made in 1950 and 1951 in the apparent depth range of the shrimp, it is likely that future work will extend the range of occurrence. The shallowest water in which red shrimp were taken was 180 fathoms, and the deepest was 305 fathoms.



FIG. 9 - A LARGE CATCH OF PINK-GROOVED SHRIMP, FISH, AND BOTTOM TRASH FROM THE DRY TORTUGAS GROUNDS.

The best catches of red shrimp were obtained near the mouth of the Mississippi River on very soft mud bottom. Some of the catches with the 40-foot net were good, considering the short time the net was on the bottom. The use of larger gear met with less success. Of eight drags made with 100-foot flat trawls and 80-foot balloon trawls in 190 to 240 fathoms only, two were completed without some damage to the nets or doors due to bogging in the mud. The drag producing the best catch was found to have been made with the ground and head lines reversed on one side so that the net could not have been fishing properly. Another drag produced more shrimp from the wings of the net than from the tail. Modifications of the doors and trawls will be tried during future trips in an attempt to develop a method for making the longer drags proportionately as productive as shorter drags with the small 40-foot rig. The bottom does not appear especially uneven in the 200-fathom areas covered. Sonic depth-sounder tracings do not show irregularities such as are characteristic of the "mud lumps" in shallower water near the mouth of the Mississippi River. It is possible that improvements can be made in the performance of the trawls by adjustments in the cut of the doors, length of trawling cable used, and by minor changes in hanging the trawls.

#### SUMMARY

As part of a general program of fishery exploration and gear research in the Gulf of Mexico, the M/V Oregon has been operated with major emphasis on exploration for shrimp, and during the second half of 1950 and in 1951 completed exploratory coverage of grounds contiguous to the major shrimp-producing areas in the Gulf as well as partial coverage of some of the more-accessible grounds at considerable distances from regular shrimp-fishing activities of the commercial fleet. The fishing log supplemented by the data to be collected in 1952 will form the basis for a comprehensive report on shrimp exploration in the Gulf.

Preliminary phases of work with various designs of shrimp trawls, bottomless trawls, a midwater trawl, and related gear have been completed, and studies of the performance and limitations of common types of trawls will provide a basis for trying more radical gear in 1952.

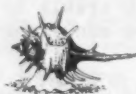
Some progress in charting and classifying trawling conditions (types of bottom) in the Gulf was made during 1951. It is planned to continue this phase of the work in 1952, using a greater variety of exploratory gear.

Although 19 species of shrimp have been identified from Oregon catches, only species of commercial interest (white, brown-grooved, pink-grooved, and red) are shown in the fishing log, along with other important fishery resources, such as red snapper. On three occasions white shrimp were located outside their usual depth range or geographical range. Discoveries of new concentrations of brown-grooved shrimp by the Oregon have led to extension of the commercial fishing grounds and an increase in the productive potential of the fishery. Exploration in 30 to 50 fathoms in the vicinity of the Mississippi delta revealed the presence of important quantities of large brown-grooved shrimp beyond the normal depth range of the fishery, and this area has subsequently become a part of the regular fishing grounds for the larger vessels operating in the vicinity.

The Oregon has caught deep-water red shrimp throughout the year over a wide range of the Gulf in depths from 180 fathoms to 305 fathoms. Best catches of red shrimp have been made near the mouth of the Mississippi River on very soft mud bottom, and the species has been taken off Aransas Pass, Tex., and southeast of Pensacola, Fla. Catches indicated that commercial fishing of red shrimp might prove feasible when problems of fishing at such depths on the extremely soft bottom are solved. Experiments are continuing to improve effectiveness of the trawls by such methods as varying the cut of the doors and the length of trawling cable, and by changes in hanging the trawls.

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## INCREASING THE SPREAD OF SHRIMP TRAWLS

By Carl B. Carlson\*

As a result of a series of experiments on the new shrimp trawler M/V Antillas, it was found that a relatively simple modification produced a marked increase in

Table 1 - Method of Attachment and Spread of Otter Boards

Test	Method of attachment	Calculated Spread of Otter boards	
		Angle	Feet
1	Trawl on pad eyes rear of door; cables towed from stern davits .....	11°15'	58.8
2	Trawl on pad eyes rear of door; cables towed from hook .....	10°15'	53.6
3	Trawl on end of door; cables towed from stern davits .....	10°15'	53.6
4	Trawl on end of door; cables towed from hook ....	8°40'	45.3

the spreading power of the otter boards. (The Antillas is owned by the Gibbs Corp. and operated in exploratory fishing and gear research under a cooperative agreement with the U. S. Fish and Wildlife Service). Common practice in the south-

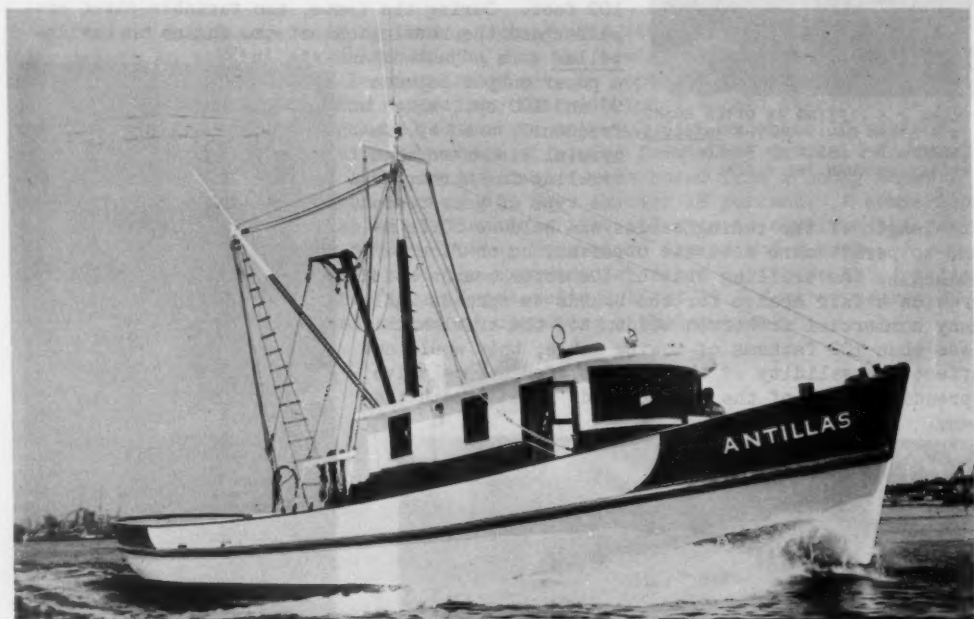


FIGURE 1 - THE EXPERIMENTAL SHRIMP TRAWLER M/V ANTILLAS.

ern shrimp fishery is to attach the float lines and foot lines to brackets on the trailing end of the otter boards. Attachment of these lines to pad eyes on the back side of the board, opposite to the after or long pair of chains, was found

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to increase the spread of the boards by more than 18 percent, as shown by a comparison of Items 2 and 4 in Table 1.



FIGURE 2 - LIFTING AN OTTER BOARD TO A STERN DAVIT ON THE ANTILLAS. (NOTE: THE CABLE IS TOWED DIRECTLY THROUGH THE BLOCK.)

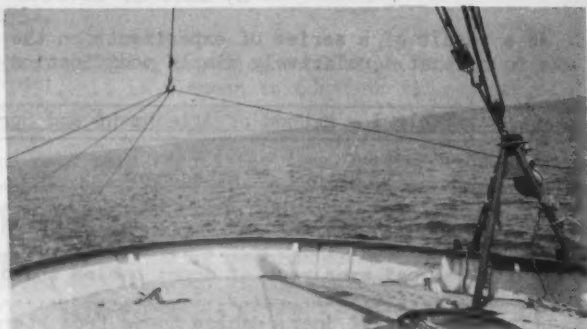


FIGURE 3 - TOWING THE CABLES THROUGH A HOOK TO DUPLICATE COMMON PRACTICE IN THE SHRIMP FISHERY.

The otter boards used in these experiments were a standard set measuring 40 inches high and 9 feet long, and the trawl was a 100-foot flat trawl, having legs to bring the total length along the foot line to 109 feet. During the tests, the variable-pitch propeller and the revolutions of the engine on the Antillas were adjusted for a power output between 90 and 100 hp., which is frequently used by commercial fishermen when trawling for shrimp with the type of gear tested.

The length of the towing cables was held at 50 fathoms to permit more accurate observations on floats attached to the trailing ends of the otter boards and to provide a fair chance for the boards to spread. While many commercial fishermen seldom tow the trawl with less than 100 fathoms of towing cable, this would not affect the validity of the results, for the relative spreading power of the otter boards would remain the same.



FIGURE 5 - EXPERIMENTAL WINCH USED ON ANTILLAS HAVING A CAPACITY FOR 600 FATHOMS OF 7/16-INCH DIAMETER CABLE.



FIGURE 4 - METHOD OF ATTACHING PAD EYES AND CHAFING CHAIN TO OTTER BOARDS. (NOTE: TO OBTAIN MAXIMUM VERTICAL OPENING OF NET AND TO ASSURE ITS TENDING BOTTOM, PAD EYES SHOULD BE AS NEAR TOP AND BOTTOM OF BOARDS AS POSSIBLE.)

The Antillas is fitted with a special winch to fish in depths up to 200 fathoms, and a pair of davits (one located on each side near the stern) for experimental gear-development work. These davits are shown in figures 2 and 3. The method of towing both cables from a hook over the stern for comparative tests between the conventional method of towing shrimp trawls and the experimental method also is shown in figure 3. When using the stern davits the cables are towed directly through the blocks.

Figure 4 shows the pad eyes, attached to the rear side of the otter board, and a portion of the  $\frac{1}{2}$ -inch diameter chain 30 links long which was used for attaching the trawl. The pad eyes consist of a U-shaped eye of  $\frac{1}{2}$ -inch diameter stock welded to a  $\frac{1}{2}$  x 2 x 5-inch plate and are fastened to the boards by  $\frac{3}{8}$ -inch diameter bolts. They are shown as attached between the main towing chains, but should be located as near the top and bottom of the boards as possible to assure maximum vertical opening of the net and its tending bottom. The weight shown on the back side of the door is removable, but its use together with adjustment of the chain-towing bridle has permitted fishing at depths in excess of 115 fathoms with otherwise standard shrimp gear.

The spread of the otter boards was determined from the Antillas by taking bearings with a sextant on floats attached to the trailing end of the boards, and the use of trigonometric formulas. Table 1 presents the data and spread under various conditions.

Tests 1 and 3 were made by towing through the stern davits. When towing in this manner an initial advantage exists, for the towing cables are spread a distance of about 15 feet when leaving the stern, in contrast to towing from a hook as shown in figure 3. In this comparison the additional spread attributable to the pad eyes over the conventional method is only 5.2 feet or about 10 percent, reflecting somewhat the initial advantage of towing from stern davits. However, a comparison of Items 2 and 4 (where the cables were towed from a hook) shows a difference in favor of the pad eyes of 8.3 feet or over 18 percent. A comparison of Items 2 and 3 reveals that the influence of the pad eyes is equal to the restriction of the difference between towing from stern davits and a hook. A comparison of Items 1 and 4 shows that the experimental stern davits on the Antillas coupled with pad eyes resulted in an increased spread of 13.5 feet or nearly 30 percent over the conventional method of operating a shrimp trawl.





# RESEARCH

## IN SERVICE LABORATORIES

June 1952

REFRIGERATION: Freezing Fish at Sea, Defrosting, Filleting, and Refreezing the Fillets: Test cruises 9 and 10 were completed by the Delaware, netting a total of 50,000 pounds of whole scrod and haddock. The fish were sold through the New England Exchange at Boston and apparently will be used by the purchasers to become acquainted with processing and marketing the new product. Instructions for thawing and processing the frozen round fish, based on current knowledge, were developed by the Boston Fishery Technological laboratory and are summarized in Technical Note No. 21, which appears on pp. 18-19 of this issue.

The refrigeration equipment and brine freezer operated satisfactorily under loads equivalent to normal fishing operations. Under peak load when fishing operations provided abnormally high catches, the refrigeration system was rather hard pressed. It is expected that improvements in the efficiency of the operation and in the equipment itself will eventually solve this problem. (Boston)

\* \* \* \* \*

BYPRODUCTS: Vitamin Content and Nutritive Value of Fishery Byproducts:

(a) Work of other investigators seemed to indicate that presence of potassium cyanide favorably affected the microbiological assay for vitamin B<sub>12</sub>. Tests so far on the effect of cyanide on the vitamin B<sub>12</sub> assay of certain fishery products indicated no significant results. Addition of potassium cyanide to the sample before extraction, to the assay medium, or to both, did not produce any significant change in the final vitamin B<sub>12</sub> assay in stickwater or stickwater-and-meal mixture. The effect of potassium cyanide on the vitamin B<sub>12</sub> assay of pilchard meal will be considered next. (Seattle)

\* \* \* \* \*

(b) Informal tests were carried out on the effect of feeding a high concentration of fish solubles to chicks on the palatability of the poultry meat. The birds were fed a diet containing about 20 percent condensed fish solubles, 3 percent alfalfa meal, 1 percent cod-liver oil, and 76 percent yellow corn meal (all by weight). Growth was slow, otherwise the birds seemed to fatten nicely. After 25 days on test, the birds were dressed and distributed to staff members for taste testing. All reports so far indicate no fishy or other off-flavors in the birds. (College Park)

\* \* \* \* \*

ANALYSIS AND COMPOSITION: Composition and Cold-Storage Life of Fresh-Water Fish: Additional samples of fresh-water fish were obtained for test purposes. These included: (1) sheepshead and carp from the Mississippi River; (2) laketrout from Lake Superior; and (3) sheepshead, yellow perch, yellow pike, and blue pike from Lake Erie.

Cooperative Work with the Association of Official Agricultural Chemists on the Determination of Oil in Fish Meal: The purpose of this project is to find a more accurate and possibly a more convenient method for the determination of the oil content of fish meal. The current edition of Methods of Analysis of the A.O.A.C. presents a rapid and accurate method for the determination of oil in fish meal. An acid-hydrolysis method, employing Mojonnier equipment, is used. Experiments were carried out to determine whether or not this method of analysis is applicable to fish meal. Three procedures were tried: (1) The A.O.A.C. acetone-extraction method, consisting of an acetone extraction of the sample followed by acid hydrolysis and further solvent extraction.

(2) The A.O.A.C. acetone extraction method followed by acid hydrolysis and extraction employing Mojonnier equipment.

(3) Direct acid hydrolysis and extraction of the original meal, employing Mojonnier equipment.

The Mojonnier method (3) gave consistently lower values than the acetone extraction procedure (2). It also gave lower results when substituted for the acid digestion following the acetone extraction (procedure 2). (Seattle)

\* \* \* \* \*

NUTRITION: Study of Cause of Texture Change of Canned Salmon Prepared from Frozen Fish: Freezing and subsequent storage of salmon prior to canning produces adverse changes in the appearance and texture of the canned product. The most important changes are the formation of excessive curd and toughening of the canned product.

Studies have shown that brining the cut sections of thawed salmon prior to canning reduces the extent of these changes. Statistical comparisons of the mean penetration values obtained from three canned salmon packs showed that canned salmon prepared from frozen fish and packed in the normal style with dry salt is significantly tougher than the same fish if given a short brine treatment prior to canning. The fish used in these tests were coho salmon which had been held in cold storage at  $-20^{\circ}$  F. for 28 weeks before thawing and canning. The thawed fish were cut into can-size steaks and divided into three lots. The first lot was given a 10-minute brining in  $70^{\circ}$  salinometer brine. The second lot was given the same treatment but 2 percent disodiumphosphate was added to the brine. The third lot was prepared in the normal cannery fashion with dry salt being added to the can. A total of 36 cans were packed, 12 in each lot.

Although the data obtained are only representative of a few fish of one species which had been stored under one set of conditions, they show that brining materially lessens curd formation and tends to reduce the toughening associated with canned salmon prepared from frozen fish. The addition of 2 percent disodiumphosphate to the brine did not appear to increase the efficiency of the brine treatment. (Ketchikan)





## TECHNICAL NOTE NO. 21--EQUIPMENT AND PROCEDURE FOR THAWING FISH FROZEN AT SEA

These recommendations <sup>1/</sup>for thawing fish frozen at sea are made for the preliminary guidance of commercial concerns considering the possibility of processing fish frozen at sea by the Service's experimental trawler Delaware or by commercially-operated freezing vessels which may follow. Technologists of the Service's Fishery Technological Laboratory at Boston are ready to advise and assist any New England company planning the installation and operation of thawing equipment.

The time required to thaw brine-frozen fish depends primarily on the temperature of the defrosting medium, on how efficiently the medium circulates past each fish, and on the size (and the shape) of the fish. As a defrosting medium, water seems to be the most efficient in all respects. Because a commercial operation normally involves a wide variety of sizes of fish, it is believed that a batch-thawing process is the most practical.

Fish frozen at sea should be thawed in a tank of well-circulated freshwater at 60° F. If the water is at a lower temperature, the time required to thaw the frozen fish would be longer than necessary. It takes approximately twice as long to thaw a given fish at 45° F. as at 60° F. Use of water at temperatures higher than 60° F. is not recommended at this time. (More research is needed on the effects of thawing at high temperatures on fish frozen in the round at sea.)

The relation between the size of a cod or haddock and the time required to thaw it is given in table 1. The most important size measurement is the side-to-

side thickness at the widest point on the fish. A flounder, or any other fish that is far from cylindrical in shape, requires a somewhat (about 50 percent) longer time to thaw than the time as shown in table 1. Experimentation showed that a cod or haddock can be filleted even when the backbone and part of the visceral cavity are still frozen. Therefore, and extra column giving the time required to thaw to a filletable stage is included in table 1.

Table 1 - Time Required to Thaw Whole Round-Frozen (0° F.) Cod and Haddock of Various Thicknesses in Water at 60° F.

Thickness Inches <sup>1/</sup>	Approximate Round Weight <sup>2/</sup> Pounds	Thawing Time at 60° F.	
		Completely Minutes	For Filleting Minutes
1 <sup>1</sup> / <sub>2</sub>	1-1 <sup>1</sup> / <sub>2</sub>	60	50
2	1 <sup>1</sup> / <sub>2</sub> -2 <sup>1</sup> / <sub>2</sub>	100	85
2 <sup>1</sup> / <sub>2</sub>	3-5	150	125
3	4 <sup>1</sup> / <sub>2</sub> -7 <sup>1</sup> / <sub>2</sub>	210	170
3 <sup>1</sup> / <sub>2</sub>	7-10	280	220
4	9-12	360	285

<sup>1/</sup> SIDE TO SIDE THICKNESS (SMALLEST DIAMETER OF A CROSS SECTION) AT THE POINT OF MAXIMUM GIRTH.

<sup>2/</sup> ROUND WEIGHTS ARE GENERALLY 10 TO 15 PERCENT HIGHER THAN DRESSED WEIGHTS.

To permit the necessary movement of water around each fish, the tank should have a total volume of 70 cubic feet for each 1,000 pounds of fish per thawing load. Wherever space is not at a premium, tanks about 30 inches deep are advisable. If the tank is too deep, the fish may "pack" together excessively. At the start of the thawing process, the frozen fish tend to float; after the fish are partially thawed they generally tend to sink in fresh water. If the tank is not too deep, these tendencies to float or sink can be overcome by a simple circulating system.

The fish can be conveniently loaded into and out of the tank in large baskets constructed of metal mesh on angle iron frames.

<sup>1/</sup> BASED ON RESULTS OF EXPERIMENTATION TO BE REPORTED IN DETAIL IN A FUTURE ISSUE OF THIS REVIEW.

To secure most rapid thawing, the water must be continuously circulated past each fish. When the water is not well circulated, the fish in the center of the mass may require several times the usual period to thaw. After such long periods in the tank, the quality of the thawed fish on the outside of the mass may have deteriorated.

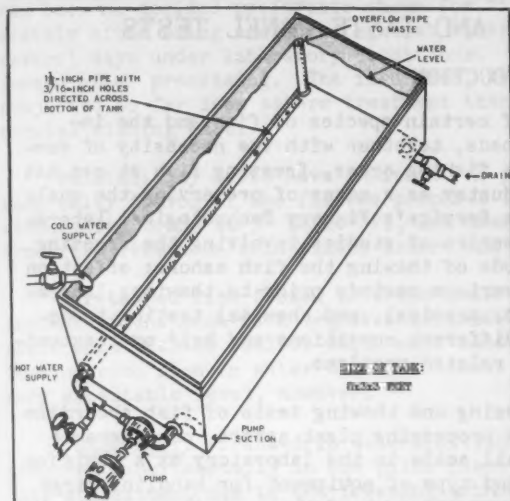


FIG. 1 - OUTLINE DRAWING OF TANK FOR WATER THAWING FROZEN FISH IN THOUSAND-POUND BATCHES.

For the most effective use of the equipment, it is suggested that a load of large cod or haddock be thawed at night. The circulating system should be operated but no special heat should be added. In 16 hours the heat received from the environment and the heat dissipated by the circulating system would be sufficient to thaw the fish completely. However, during the entire period the water would be relatively cool (near 38° to 40° F.). Then, during the regular working day three to five lots of fish could be thawed at 60° F.

Figure 1 illustrates some of the details of a semi-movable tank large enough to thaw about 1,000 pounds per batch. The tank (8 feet long, 3 feet wide, and 3 feet deep) can be constructed of 16 gauge galvanized iron, reinforced with angle irons. Of course there must be a drain in the bottom for cleaning, but there should also be an overflow pipe to maintain the proper water level and to skim off foam and floating debris. The recirculating system would consist of a 1/3 hp. centrifugal sump pump connected to a 1 1/2-inch pipe manifold lying along one side of the bottom of the tank. In the manifold there should be five or six 3/16-inch holes directing the flow of the water across the bottom of the tank. At a T in the line, hot water would be added as required. It would be advantageous to have the hot water supply valve automatically controlled by the temperature of the thawing water. Hot water can be supplied by a simple gas-heated hot-water system. The tank, as illustrated, could hold three baskets, 25 by 31 by 33 inches in size, each capable of holding 340 pounds of frozen fish.

An arrangement suitable for a plant handling only 8,000 to 10,000 pounds of frozen fish per day would include two of the semi-movable tanks described, a 200,000 B.T.U.-per-hour hot-water heating system, an overhead monorail and hoist, and eight (2 extras) baskets. It is estimated that this equipment, including two 1/3 hp. pumps and two temperature regulators, would cost in the neighborhood of \$1,500. Approximate operating costs, attributable to the thawing process, would be: Water, 5 cents; fuel (gas) 43 cents; electric power, 2 cents; a total of 50 cents per 1,000 pounds of fish thawed. This figure does not include the cost of labor and the costs connected with the storage of the frozen fish.

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## TECHNICAL NOTE NO. 22--FISH FROZEN IN BRINE AT SEA: PRELIMINARY LABORATORY AND TASTE-PANEL TESTS

### INTRODUCTION

In view of the apparent scarcity of certain species of fish and the increased time required in obtaining payloads, together with the necessity of covering greater distances to reach present fishing areas, freezing fish at sea has aroused considerable interest in the industry as a means of preserving the quality of the fish. With this in mind, the Service's Fishery Technological Laboratory at Boston, Mass., has under way a series of studies involving the freezing and frozen-storage of fish at sea; methods of thawing the fish ashore; effect on quality of holding the frozen fish for various periods prior to thawing; laboratory examinations involving organoleptic, physical, and chemical testing to determine quality of fish prepared under different conditions and held over extended periods of frozen storage; and other related problems.

Prior to beginning large-scale freezing and thawing tests of fish aboard the experimental trawler Delaware and in the processing plant ashore, considerable preliminary work had to be done on a small scale in the laboratory as a basis for designing and planning the proper size and type of equipment for handling large quantities of fish. The results of the greater part of these studies, and the experimental procedure used, have been given in previous reports (Hartshorne and Puncoschar 1952; Magnusson, Pottinger, and Hartshorne 1952).

Further preliminary studies of freezing and thawing fish were later conducted on a somewhat larger scale. A larger tank for water-thawing the fish permitted more closely-controlled studies of this phase of the operation. Also, facilities were developed for making quality evaluation studies of fish to determine the effects of various freezing and thawing procedures on the quality of the resulting products. The results serve as a guide in developing adequate procedures. The procurement of iced and brine-frozen fish of known history from the Delaware enabled controlled studies to be made of the effects of refreezing and frozen storage on the quality of the fillets prepared from these fish. Some of the preliminary laboratory findings, not previously reported, are given in this report.

### RESULTS OF PRELIMINARY LABORATORY TESTS

Some of the fish used in the preliminary tests were of unknown history and often of questionable freshness. They were, however, quite satisfactory for use in developing procedures and obtaining certain preliminary data relative to small-scale freezing and thawing tests, setting up procedures for conducting palatability tests, determining salt penetration, and other tests to be used in the project.

**PALATABILITY TESTS:** Palatability tests have been made on a number of the samples of fillets prepared in the course of these preliminary tests conducted in the processing plant ashore. These fillets were prepared under strict experimental conditions in determining freezing rates, salt penetration, thawing rates in air and in water, and such other problems under consideration.

The palatability tests on the samples prepared in the pilot plant and laboratory have not indicated any definite preference for fillets prepared from un-

frozen fish as compared to fillets from previously frozen and thawed fish. The fillets in both cases were frozen immediately after processing. There likewise has been no decided preference shown for fillets prepared from fish frozen immediately after being caught as against those prepared from fish held in ice for several days under laboratory conditions. Again the fillets in both cases were frozen after processing. The iced fish, however, were considered to have been subjected to far less severe treatment than would be encountered aboard a commercial fishing boat.

Palatability tests have indicated no particular objections to the slightly more salty flavor of the fillets prepared from fish frozen experimentally in circulating brine at 5° to 10° F., and then air-thawed over fillets prepared from fish frozen on cold plates ashore and air-thawed.

Air-thawed fish frozen in brine under conditions which increased the salt content of the meat to a degree considerably over the minimum threshold of salt preference yielded fillets which were sometimes objectionable to the taste panel. Thawing such fish in water tended to lower the salt content of the meat to a more acceptable level, however.

**PRESS DRIP:** Press-drip determinations made on samples of frozen fillets prepared experimentally in the pilot plant have indicated some differences in this constituent due to the freezing method. Whole haddock brine-frozen at 5° to 10° F. were thawed in water at about 50° F., filleted, and the fillets refrozen on cold plates. These fillets from brine-frozen fish showed a pressdrip of 18.8 percent. Plate-frozen whole haddock were thawed in water at about 50° F., filleted, and the fillets refrozen on plates. These fillets from plate-frozen fish showed a press drip of 13.5 percent. Fillets (processed in the same manner as the haddock) from brine-frozen whole cod showed a pressdrip of 25.1 percent; while fillets from plate-frozen whole cod showed a press drip of 19.6 percent. Cod and haddock fillets prepared from plate-frozen fish showed less press drip than fillets prepared from brine-frozen fish.

Fillets from large fish showed a greater percentage of press drip than the fillets from small fish. This variation may possibly be related to the degree of freshness of the fish at the time of freezing. Further tests to be made on fish frozen at sea immediately after they are taken from the trawl should provide pertinent information on this matter.

A study also was made of the effect of refreezing and frozen storage on the amount of press drip obtained from haddock fillets. A batch of reasonably fresh, iced, eviscerated haddock obtained for the tests from the market was filleted. A small lot of the fillets tested before freezing showed a press drip of 8.0 percent. The balance of the fillets was frozen on plates at 0° F. Immediately after freezing, samples of these frozen fillets showed that the press-drip value had increased to 19.8 percent. The remainder of the frozen fillets were wrapped in moisture-vaporproof cellophane, divided into two lots, and stored at 0° F.

After two weeks of storage, samples from the first frozen lot showed that the press-drip value had increased to about 24.0 percent. Further storage for several days, or a total of about three weeks, dropped the press drip to about 21.5 percent.

Samples from the second lot of frozen fillets were removed from storage, thawed, and refrozen progressively five times over a period of about three weeks. Thawing was done in air at a temperature of approximately 70° F. Refreezing was done on plates at 0° F. After the initial freezing, samples from this lot showed



a press-drip value of 19.8 percent. The value rose to 26.1 percent after the first thawing and refreezing. Another slight rise to 27.1 percent was noted after a second thawing and refreezing. After two weeks of storage, the samples were thawed and refrozen a third time, and the press-drip value was 31.0 percent. A slight decrease in press drip occurred after a fourth thawing and refreezing. After the fillets were thawed and refrozen for the fifth time, the press-drip value dropped to 29.4 percent. A further drop to 27.3 percent was noted after the sixth thawing and refreezing. All of the fillets were thawed in the wrappers and again refrozen in the same wrappers. Only a negligible, if any, loss of liquid occurred between the thawing and refreezing of the fillets.

The two lots of fillets (one held constantly in frozen storage and the other subjected to repeated thawing and refreezing during a period of frozen storage) showed the same trend--an increase in percentage of press drip during about the first two weeks of storage, after which a decrease occurred. There is roughly a direct relationship between the values obtained for drip from the fillets frozen only once and held in storage and those refrozen several times during storage; that is, the press-drip values for both lots rose during the first two weeks of storage, then showed a decline. However, the rate of rise in press drip up to the time the decline occurred was greater for the group frozen several times than for that of the fillets frozen only once. Therefore, the results seem to indicate that refreezing does have some effect on the quantity of press drip. There might be some significance to these observed changes in press-drip values in relation to the period of time frozen fish are held in storage prior to thawing and filleting, and to the quality of the fillets prepared from them. Further experiments are being scheduled to shed light on this aspect of the problem.

FREE DRIP: Preliminary values for free drip for random samples of frozen fillets have not shown variations as extreme as those for press drip. Free-drip values are much lower, however, as might be expected, and generally have remained at about 3 to 4 percent, regardless of the treatment the fillets received.

SALT CONTENT: The salt content of the skin of the fish increases considerably as a result of brine-freezing. Penetration of the salt through the skin and into the meat of the fish has not been found to be too great, however, under optimum conditions of brine-freezing. A comparison was made of the salt content of iced, dressed cod and haddock with that of fish frozen in about 80° salinometer brine at a temperature of about 6° F. The salt content of the skin of the fish showed an increase from an initial value of about 0.4 percent to 1.3 percent, respectively, while that of the first one-quarter inch of meat beneath the skin increased from approximately 0.2 percent initially in iced fish to only 0.4 percent in brine-frozen fish. The second one-quarter inch of meat beneath the skin had an initial salt content of slightly under 0.2 percent for iced fish and increased to only about 0.3 percent in brine-frozen fish. As mentioned previously, palatability tests have shown no particular objections on the part of the taste panel to the slightly more salty flavor of brine-frozen fish which were not subjected to water-thawing.

Samples of brine-frozen fish thawed in fresh water have indicated that the salt content of the meat will be reduced to approximately that of the meat prior to freezing. Thawing in air will, of course, not change the salt content of the fish appreciably.

Results have indicated that salt will continue to penetrate the meat if the fish, after being frozen, are allowed to remain in the brine. For frozen fish held in the brine at about 6° F. for 20 hours, the salt content of the second quarter-inch of meat was found to be slightly over 1.5 percent as compared to only



about 0.3 percent for the fish removed immediately after freezing. Fish that were frozen and then allowed to remain in the brine for about 36 hours with the refrigeration turned off, permitting the temperature of the brine to rise slowly to about 18° F., had a salt content exceeding 5 percent in the first one-quarter inch of meat, which is considered excessively high. In general, fish that have been allowed to remain for any length of time in brine at temperatures above 10° F. have shown a very high salt content.

TRIMETHYLAMINE CONTENT: As the relative state of freshness of many marine fish decreases, there is an increase in the quantity of trimethylamine that is formed in the meat of the fish. In the case of certain bottom fish taken in the northwest Atlantic area, a value of 15 mg. of trimethylamine nitrogen in 100 g. of fish is generally considered to indicate that the fish is not salable.

In developing the technique for determining trimethylamine in fish by a spectrophotometric method, some samples of fish that had been frozen for some time, then thawed, and held at a temperature of about 40° F. were at first used in an attempt to determine the increase in trimethylamine content at intervals as spoilage progressed. It was noted, however, that only very small increases in trimethylamine occurred, with a maximum of only about 8 mg. of trimethylamine nitrogen per 100 g. of fish even when the fish were judged to be badly spoiled on the basis of odor and appearance. After repeating the tests several times with other similar samples and obtaining much the same results, it was thought that freezing may possibly have been responsible for the failure of trimethylamine to form after the fish were thawed and held until spoiled. After again repeating the tests, but this time with fish that had not been frozen, a significant rise in trimethylamine content occurred. Under these conditions, fish that had been held at a temperature of 40° F. until spoilage occurred had a trimethylamine nitrogen content of about 46 mg. per 100 g. of fish.

These results may have some significance in that trimethylamine determinations are relied upon to some extent for indicating relative freshness of certain varieties of fish. If the results reported above are found to be generally true, and the trimethylamine test does not appear to be valid for indicating the freshness of fish that have been frozen and then thawed and held at temperatures somewhat above freezing, the value of this determination will, of course, be definitely limited. Further tests along this line are planned in order to determine the effects of freezing and frozen storage on trimethylamine formation in the thawed product.

The trimethylamine determinations will be used in this project primarily to obtain some indication of the relative freshness of the iced fish prior to being frozen. Tests will also be made on the fillets being held in frozen storage to determine whether there is any appreciable change in trimethylamine content over a long period of storage. Although some results of this type were reported previously (Hartshorne and Puncochar 1952), the storage period was limited to only five months.

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1952. FREEZING FISH AT SEA--NEW ENGLAND. PART 1 - PRELIMINARY EXPERIMENTS. COMMERCIAL FISHERIES REVIEW, VOL. 14, NO. 2 (FEBRUARY), PP. 1-7.
- MAGNUSSON, H. W.; POTTINGER, S. R.; AND HARTSHORNE, J. C.  
1952. FREEZING FISH AT SEA--NEW ENGLAND. PART 2 - EXPERIMENTAL PROCEDURES AND EQUIPMENT. COMMERCIAL FISHERIES REVIEW, VOL. 14, NO. 2 (FEBRUARY), PP. 8-15.

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# TRENDS AND DEVELOPMENTS

## Additions to the Fleet of U. S. Fishing Vessels

A total of 104 vessels of 5 net tons and over received their first documents as fishing craft during May 1952--16 less than in May 1951. Washington led with 51 vessels, followed by Alaska with 23 vessels and Maryland with 5 vessels, reports the Treasury Department Bureau of Customs.

Vessels Obtaining Their First Documents as Fishing Craft, May 1952					
Section	May		Five mos. ending with May		Total
	1952	1951	1952	1951	1951
	Number	Number	Number	Number	Number
New England .....	4	7	10	15	36
Middle Atlantic .....	4	5	16	20	34
Chesapeake .....	8	-	27	6	36
South Atlantic .....	4	12	33	43	118
Gulf .....	4	18	43	86	173
Pacific Coast .....	57	61	109	142	284
Great Lakes .....	-	2	4	7	25
Alaska .....	23	15	70	44	71
Hawaii .....	-	-	-	1	3
Total .....	104	120	312	364	780

NOTE: VESSELS HAVE BEEN ASSIGNED TO THE VARIOUS SECTIONS ON THE BASIS OF THEIR HOME PORT.



## California Sardine Catch for 1951-52 Season

If the figures for the 1951-52 commercial fishing season ended on February 2 this year are any indication, California's sardine barrel is nearly empty, the State's Department of Fish and Game reports. From landings of nearly half a million tons annually in 1939, 1941, and 1944, the California sardine fishery has shrunk to a total catch of 126,541 tons for the 1951-52 season. This is the lowest annual total since the 1947-48 season, when 121,330 tons were landed.

Towards the end of the season landings were made almost exclusively in Southern California ports, and were composed principally of three-year old fishes--"breeding stock" for future generations.

"The California sardine will come back eventually," says the Chief of the Department's Bureau of Marine Fisheries. "The ocean is too large to be 'fished out' and the sardines are too numerous to be wiped out as a species by any combination of factors. Intelligent management of the fishery, based on continuing research, can help nature bring the sardine back sooner. But any come-back will have to be earned by full support for the management program which is now being mapped out."

Meanwhile, California fish cannery have requested the Legislature to make an additional 50-cent-per-ton assessment on all sardines landed. This raises the total tax to \$1.50 per ton, \$1 of which supports joint sardine research by the Department of Fish and Game, California Academy of Sciences, University of California, U. S. Fish and Wildlife Service, and Stanford University. The remaining 50 cents supports Department of Fish and Game activities.



### California Tags Tuna With Experimental-Type Tags

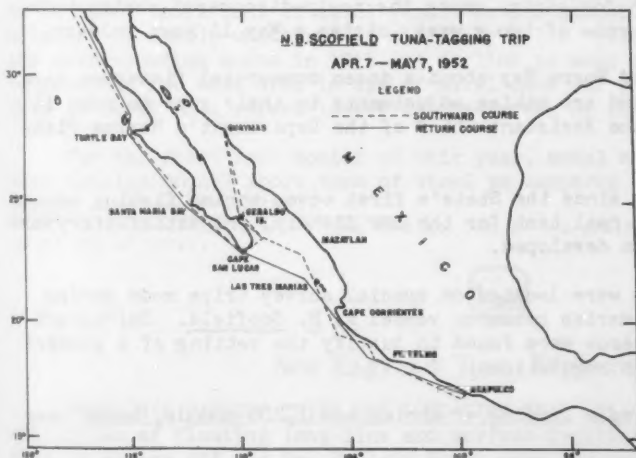
In order to tag yellowfin and skipjack tuna with experimental-type tags, the M/V N. B. Scofield, a research vessel of the California Bureau of Marine Fisheries, sailed from Los Angeles Harbor on April 7 and returned on May 7, 1952. The purpose of this trip (Cruise 3) was:

- (1) to use various types of tags in further testing application methods and effect upon tuna and skipjack;
- (2) to collect specimens of other species, incidental to live-bait fishing operations, by trolling, bait nets and night lights;
- (3) to collect juvenile tunas for age-determination studies;
- (4) to incidentally collect bathythermograph observations.

The vessel, which covered about 4,000 miles, operated off the West Coast of Baja California, in the Gulf of California as far north as Guaymas, and off the west coast of Mexico and south to Acapulco.

Bait was sought in Turtle Bay, Santa Maria Bay, and Magdalena Bay. In Magdalena Bay 175 scoops of 6-9-inch sardines were taken. A bait net 150 feet long and 8 fathoms deep with  $\frac{1}{2}$ -inch bag mesh was used. The vessel then proceeded to Cape

San Lucas where all but a few scoops of the bait died because the bait-tank pump did not operate correctly. After seeking bait at Cerralbo Island with no success, the vessel proceeded to Guaymas Bay where 300 scoops of bait were taken under a surface light extended off the stern of the vessel. This bait consisted primarily of thread herring with some anchovettas mixed in. After leaving Guaymas, the vessel proceeded south via: Cerralbo Island, position latitude  $23^{\circ}05'N$ . longitude  $107^{\circ}36'W$ ., 450-fathom bank off Mazatlan; Las Tres Marias Islands; and then down the coast inshore and offshore as far south as Acapulco. After calling at Acapulco, the vessel worked inshore and offshore for two days up to Manzanillo and then northward. All the yellowfin tuna tagged were caught between Manzanillo and Acapulco. A total of 240 yellowfin tuna, 3 black skipjack tuna, 1 bonito, and 2 frigate mackerel were tagged. No fish were encountered in the Gulf of California area.



The bait obtained at Guaymas held up very well and about 30 scoops were dumped at Santa Catalina Island 2½ weeks after their capture.

The following are the two types of tags used:

Type C. A hollow vinylite tube yellow or blue in color, 20 to 25 cm. (8-10 inches) long, with a piece of stainless steel wire running through. A small piece of paper, giving pertinent information was inserted into the center of the tube. The tags were placed through the back of the fish below and slightly behind the second dorsal fin. The tags were applied by placing them in a hollow sharpened tube, passing the tube through the flesh of the fish, sliding out tube, twisting the two ends of wire together over the fish's back.

Type D. A 2.5 cm. (1 inch) plastic tube with legend and nylon line enclosed. A knot was placed in the end of the nylon line to keep the tube in place, the entire end was dipped in liquid plastic and allowed to dry and harden. A loop was formed in the other end of the line. The tag was applied by a hollow sharpened metal tube containing the tag being passed through the flesh of the fish. When the metal tube was removed, the plastic streamer on one side was passed through the loop on the other side and allowed to dangle over the fish's back.

About 150 juvenile frigate mackerel (Auxis thazard) were taken under the night light at latitude 17°07'N. longitude 102°18'W. on April 24, 1952. No juvenile yellowfin or skipjack tuna were taken during this cruise.



## California Fishermen Obtain Licenses For Shrimp Fishing

More than 35 California fishermen have been licensed by that State's Department of Fish and Game to fish for shrimp among the newly-discovered shrimp beds and more are applying at the rate of two a week, states a May 14 news release.

Between Crescent City and Morro Bay about a dozen commercial fishermen have built special shrimp trawls and are making adjustments to their gear to make it fish properly, according to the Assistant Chief of the Department's Marine Fisheries Branch.

Rough weather conditions since the State's first ocean shrimp fishing season opened April 1 have delayed a real test for the new fishery, and satisfactory marketing plans have not yet been developed.

The offshore shrimp beds were located on special survey trips made during 1950 and 1951 by the State's marine research vessel N. B. Scofield. Sufficient concentrations of the crustaceans were found to justify the setting of a commercial season and gear and catch regulations.

By May 1, the largest single landing of shrimp was 1,200 pounds, taken near Morro Bay.

However, reports indicate that the Northern California shrimp fishery out of Eureka was abandoned towards the latter part of May when the packers learned that the shrimp brought in were too small to market at a profit to both the fishermen and processors.

NOTE: ALSO SEE: COMMERCIAL FISHERIES REVIEW, APRIL 1952, P. 24.





## Federal Purchases of Fishery Products

FRESH AND FROZEN FISH PURCHASES BY DEPARTMENT OF THE ARMY, MAY 1952: A total of 2,518,736 pounds (valued at \$1,180,951) of fresh and frozen fishery products were purchased by the Army Quartermaster Corps during May 1952 for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force (see table). This was a drop of 11.6 percent in quantity and 10.3 percent in value as compared with the previous month's purchases, but lower by 12.6 percent in quantity and higher by 5.4 percent in value as compared with May 1951.

Purchases of Fresh and Frozen Fishery Products by Department of the Army (May and the First Five Months, 1952 and 1951)							
Q U A N T I T Y				V A L U E			
May		January-May		May		January-May	
1952	1951	1952	1951	1952	1951	1952	1951
<u>lbs.</u>	<u>lbs.</u>	<u>lbs.</u>	<u>lbs.</u>	<u>\$</u>	<u>\$</u>	<u>\$</u>	<u>\$</u>
2,518,736	2,880,530	12,235,533	11,527,766	1,180,951	1,120,427	5,727,454	4,737,372

Purchases for the first five months of 1952 were greater by 6.1 percent in quantity and 20.9 percent in value as compared with the corresponding period of 1951. The average price per pound of 46.8 cents paid for fresh and frozen fishery products during the first five months this year was considerably higher than the 41.1 cents paid in January-May 1951, indicating to a certain extent that higher-priced products are being purchased this year.



## Metal Cans--Shipments for Fishery Products, April 1952

Total shipments of metal cans for fishery products for April this year amounted to 6,863 short tons of steel (based on the amount of steel consumed in the manufacture of cans), which was considerably below 7,168 short tons of steel during the corresponding month in 1951. A decline in west coast tuna canning was largely responsible for this drop in use of metal cans for packing fishery products. This is based on a report issued by the Bureau of the Census on June 24.

For the first four months of this year, metal can shipments for fishery products totaled 20,497 short tons of steel as compared with 23,919 short tons of steel during January-April 1951.

NOTE: DATA CONVERTED TO SHORT TONS OF STEEL ARE ON THE BASIS OF 23.0 BASE BOXES OF STEEL PER SHORT TON OF STEEL.



## New England Tuna Explorations

"MARJORIE PARKER" TRIES OUT LONG-LINE GEAR (Fishing Cruise No. 1): The possibilities of floating long-line and surface-trolling gear for capturing bluefin tuna in waters off the New England Coast were explored by the schooner Marjorie Parker on its first trip of this year's New England tuna explorations. The vessel left Portland, Maine, June 1 and returned on June 13. During the 13-day trip, nine long-line sets were made. Fishing operations were conducted at selected spots from a southernmost point approximately 40 miles off Cape May, New Jersey, to the area off Boon Island, Maine.

No bluefin tuna were caught during the trip, although small quantities of shark and groundfish were taken. Surface-trolling gear was also tested without success. Long-line sets were made offshore from the following areas: Cape May, N. J.; Barnegat, N. J.; Fire Island, N. Y.; Montauk Point, N. Y.; Block Island, R. I.; South Channel near Tobins Bank; Race Point, Mass.; Ipswich Bay, Mass.; and Boon Island, Maine.



No tuna, either in schools or single fish, were observed during the trip. Reports from fishing craft in the areas visited indicated that no tuna had been captured by commercial or sportsfishing craft to date. Bluefin were beginning to appear in Casco Bay, Maine, and about ten large fish had been harpooned by fishermen in that area.

This was the initial cruise of the Marjorie Parker, chartered by the U. S. Fish and Wildlife Service for a 4-month exploratory fishing operation (continuation of the 1951 project when 180,000 pounds of bluefin were caught by purse seine) designed to obtain information on the location, extent, range, and availability of bluefin tuna in the Gulf of Maine and adjacent waters. Long lines (Japanese type), gill nets, trolling gear, and possibly some bait fishing will be tested for efficiency in catching bluefin tuna in commercial quantities. Early cruises will pay particular attention to locations where bluefin normally first appear in their seasonal northward migration into Gulf of Maine waters.

The vessel left on Fishing Cruise No. 2 on June 17 and was expected to return to Portland, Maine, about June 30. Areas of operations on the cruise were to be Casco Bay, Boon Island, Maine; Jeffreys Ledge; Stellwagen Bank; Race Point; and south of Cape Cod. Long lines, surface-trolling gear, floating gill nets, and trammel nets were scheduled to be tried.



### North Atlantic Fishery Investigations

**LARGER-MESH NETS TESTED:** After completing the second of two cruises on which a series of experiments were conducted to test the effectiveness of large-mesh nets in the release of undersized haddock, biologists from the Service's North Atlantic Fishery Investigations Laboratory at Woods Hole returned to Boston aboard the commercial trawler Michigan.

The vessel fished with regular crew on Georges Bank in the usual commercial manner with standard gear, except that the meshes were larger than those normally used. On some tows the cod end of the net was rigged with a fine mesh cover to capture the small fish that escaped through the cod end.

The experiments were highly successful and definitely proved that nets with large meshes release large quantities of undersized fish. In some hauls over 2,000 pounds escaped through the meshes of the cod end and were caught in the special cover.

A careful study was made of the sizes of fish retained and the sizes released. Over 60,000 fish were measured in these experiments. The size of the fish released depends upon the size of mesh used.

This information will be used to strengthen the Service's recommendations to the International Commission for the Northwest Atlantic Fisheries for regulating the size of mesh to be used in haddock fishing on Georges Bank.

Further experiments will be conducted on board the Service's research vessel Albatross III this summer.



### Pacific Halibut Areas 3A and 1A Closed

International Fisheries Commission on June 23 announced that Pacific halibut Area 3A will be closed to halibut fishing at 12:01 a.m. (PST) July 13. Area 1A also will close at the same time. The Commission estimates that by the announced date of closure the quota of 28,000,000 pounds for Area 3A will have been attained. Pacific halibut fishing in the major areas opened May 14 instead of May 1 as in previous years. In previous years Area 4 closed with Area 3, but this year a special 17-day season has been established for Area 4. Area 3A includes all convention waters off Alaska between a line running south one-quarter east (magnetic) from Cape Spencer Light and a line running approximately south three-quarters east from the Alaska Peninsula, near Bold Cape, through the highest points on Deer and Caton Islands.

Ordinarily, the closure of Area 3 would mean the end of all halibut fishing in the Pacific, except for halibut caught incidentally. However, 1952 regulations established subdivisions of other areas to increase the production of halibut on some recently underfished banks. Two sections (Areas 2B and 2C) of Area 2 were

given the status of separate areas this season as in the 1951 season. Area 2B includes the waters in southern Hecate Strait, off British Columbia. Area 2C includes the waters between Cape Addington and Dixon Entrance, off Southeastern Alaska. A section (Area 3B) of Area 3 this season was also given the status of a separate area. Area 3B extends between the Bold Cape-Caton Island line and a line running true west from Cape Sarichef on Unimak Island.



TYPICAL PACIFIC HALIBUT SCHOONER.

Areas 2B and 2C are opened for 10 days of fishing commencing on July 26, and Areas 3B and 4 are opened for 17 days fishing commencing August 2.

Areas 3A and 1A this season were open to halibut fishing for 60 days (May 14 through July 12). This is the first season in many years that the total number of fishing days for these areas increased, since progressively for the past few years the quota has been attained in a shorter period. In 1951 the season for these areas was 56 days long, compared with 66 days in 1950, 73 days in 1949, 72 days in 1948, and 109 days in 1947.

Areas 2A and 1B closed at 12:01 a.m. (PST) June 9, 1952, this season, and halibut fishing was pursued for 26 days as compared with 28 days in 1951, 32 days in 1950, 34 days in 1949, 32 days in 1948, and 39 days in 1947.

## Pacific Oceanic Fishery Investigations

**NEW EASTERN PACIFIC TUNA GROUNDS DISCOVERED:** The rich tuna-fishing grounds discovered south of Hawaii last year extend eastward at least 2,000 miles toward Central America, according to findings of the M/V Charles H. Gilbert. This steel research and experimental fishing vessel, especially designed for mid-Pacific tuna investigations, was completed for the U. S. Fish and Wildlife Service at Tacoma last April. It is an addition to the two vessels now used by the Service's Pacific Oceanic Fishery Investigations. The vessel returned to Honolulu on June 21 after a 5,000-mile maiden voyage from San Diego.

On May 20 the Charles H. Gilbert sailed from San Diego south along 120° west longitude. Starting 670 miles north of the equator, it stopped every 90 miles to fish long lines until it was 80 miles south of the equator. On 130° west longitude the same procedure was followed except that the vessel was fishing northward. At each of the fishing stations some 8 miles of long line with hooks every 180 feet were set at daybreak and hauled aboard in the evening.

High catches were made north of the equator, the rich grounds forming a band about 400 miles wide just north of the equator and running parallel to it. Catches were over 4 tuna per hundred hooks per day, composed mostly of yellowfin tuna in the southern 2/3 of the zone and mostly big-eyed tuna (Allison tuna) in the northern third. The fish averaged nearly 150 pounds apiece. This is better fishing than commercial long-lining around Hawaii, where less than 2 per hundred hooks is the average.

Yellowfin and big-eyed tuna have probably never before been taken as far from land as the Charles H. Gilbert found them on this trip. But it was no accidental find. From a study of the oceanographic conditions, the staff of Pacific Oceanic Fishery Investigations predicted that this stock of tuna should be found in the equatorial area from the mid-Pacific area directly south of Hawaii all the way to the Central American coast. To test this prediction the vessel's voyage was planned to survey the ground halfway between the Central American coast and mid-Pacific. While the area both east and west of the vessel's survey must still be fished to fully prove the theory, this first test was the most crucial one and removes most of the uncertainty as to the trans-Pacific extent of these tuna grounds.



## Service Biologist Accompanies Japanese Salmon-Fishing Expedition

At the invitation of the Japanese Government, the U. S. Fish and Wildlife Service has despatched Francis M. Fukuhara, a Service biologist, to accompany a Japanese salmon-fishing expedition operating in the Bering Sea, according to an announcement made June 17 by the Secretary of the Interior. Fukuhara on May 30 joined the 3,700-metric-ton mothership Tenyo Maru No. 3 via a United States Coast Guard vessel.

In issuing the invitation, the Japanese Government acted in the spirit of the recently negotiated North Pacific Fisheries Convention to which the United States, Canada, and Japan are signatories.

The biologist will remain with the Japanese fleet until about July 20, working with the Japanese in the collection of scientific data on the composition and distribution of the salmon populations of the North Pacific Ocean. This study will



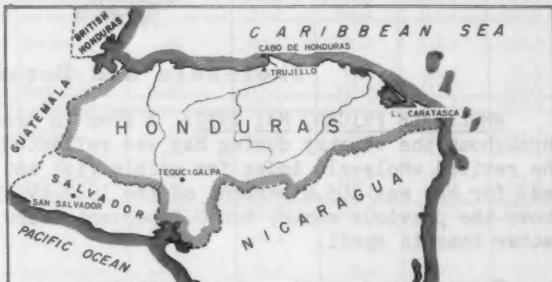
be of great importance in the conservation of American salmon resources, and is a first step toward investigations contemplated by the Fisheries Convention.

In addition to the Tenyo Maru No. 3, the Japanese fishing fleet consists of the motherships Tenryu Maru of 557 tons and Shinko Maru No. 1 of 521 tons, some 50 catcher boats, and two research vessels. The fleet has been fishing since about May 10 and, it is reported, is confining its operations to the area between latitudes 50° N. and 55° N. and longitudes 170° E. and 177° W.



### Shrimp Explorations Off the Caribbean Coasts of Honduras and Nicaragua

A preliminary exploration for new shrimp grounds was made off the Caribbean coasts of Honduras and Nicaragua during the latter part of May this year by the M/V Antillas, an experimental shrimp trawler. Owned and operated by the Gibbs Corporation, this trawler was used for the exploration under a cooperative agreement with the U. S. Fish and Wildlife Service. Sixty-four tows (57 with try nets and 7 with balloon trawls) were made offshore from a stretch of coast line about 220 miles long between Cabo Honduras, Honduras, and Punta Gorda, Nicaragua. White or pink shrimp were taken in nearly every tow. The white shrimp were found near shore and the pink shrimp well offshore.



AREA EXPLORED BY ANTILLAS WAS OFFSHORE ALONG A STRETCH OF COAST LINE ABOUT 220 MILES LONG BETWEEN CABO DE HONDURAS (HONDURAS) AND PUNTA GORDA (NICARAGUA). PUNTA GORDA IS NOT SHOWN ON THE MAP SINCE IT IS LOCATED TOWARDS THE LOWER PORTION OF THE NICARAGUAN COAST NOT COVERED BY THE MAP.

A few experimental tows indicated that commercial-scale catches of white shrimp of 500 to possibly well over 1,000 pounds per day could have been made in inshore waters. Tows with try nets well offshore and over a large area yielded from 2 to 10 pink shrimp in 15 minutes. Tows of one hour's duration with a balloon net, measuring 76 feet along the foot rope, caught about 25 pounds (heads-off weight) of pink shrimp in areas where the try net caught only 2 shrimp. In general, the size of about half of the catch of white or pink shrimp was 12 to 30 count per pound, heads off, and about half was 30 to 50 count.

The potential fishing area of mud bottom which was explored extends along at least 200 miles of coast line and for distances of 10 to 40 miles offshore in various localities. It was obviously impossible to subject any of this area to intensive fishing for the prime purpose of the expedition was to cover as much area as possible to obtain some preliminary information on the extent of the fishing grounds and the distribution of shrimp. Along the coast of Honduras, from Cabo Honduras to Punta Patuca, the bottom out to depths of 30 fathoms was predominantly mud (according to soundings) and very smooth (as shown by the automatic depth recorder) out to 20 fathoms. Outside of 20 fathoms, obstructions in the form of lumps up to 20 feet in height were occasionally registered on the depth recorder. A try net passed over several of these, but others are probably hazardous for trawling for a severe "snag" was encountered on one occasion. With the exception of a sand streak between 10 to 13 fathoms, mud bottom was found between Punta

Patuca and Cabo Falso from near shore to reefs about 40 miles offshore. From Cabo Falso to 2 miles south of Cabo Gracias A' Dios, mud bottom was predominant from near shore to the reefs.

The varieties of fish and bottom life taken were quite similar to those found off the east coast of Florida and on the Dry Tortugas area. This, together with the large area of mud bottom, an extensive system of rivers and lagoons, and the presence of some shrimp at this season, strongly indicates that the area is favorable for shrimp and that more extensive exploratory work is warranted. It may develop that the area has commercial possibilities only at certain seasons rather than throughout the year, but this question can only be answered by more extensive work.

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### Wholesale and Retail Prices

WHOLESALE PRICES, MAY 1952: A drop in production in the major fisheries throughout the country during May was reflected in an over-all increase in prices. The revised wholesale index for edible fish and shellfish (fresh, frozen, and canned) for May was 105.8 percent of the 1947-49 average (see table 1)--0.6 percent above the previous month, but 0.8 percent below May 1951. Demand was generally better than in April.

The drawn, dressed, or whole finfish sub-group index for May was 2.6 percent above April and 8.5 percent above May 1951. During May a substantial increase in fresh large drawn haddock prices was offset by a considerable drop in the prices of fresh-water fish (high prices in April were due to Hebraic holidays). Fresh haddock prices this May were 26.3 percent above April and 4.6 percent above a year earlier. Salmon prices were 2.2 percent lower than the previous month but 7.1 percent over the same month in 1951. Frozen halibut prices remained steady at April levels, but were 15.0 percent above a year earlier.

Prices for fresh processed fishery products in May declined 1.9 percent as compared to April and were 2.4 percent below May 1951. Prices for fresh haddock fillets during the month rose 3.5 percent above April, but were 0.4 percent below May a year earlier. Fresh headless shrimp prices continued to drop (due to heavy production in the South Atlantic States) and in May were 5.1 percent below April and 5.3 percent below May 1951.

Because of ample cold-storage stocks, processed frozen fish and shellfish prices in May dropped 1.4 percent below April and were 1.5 percent lower than in May last year. The drop was the result of substantial declines from April to May in frozen flounder fillet (5.1 percent) and frozen haddock fillet (2.0 percent) prices. Ocean perch fillets and frozen shrimp remained steady at April levels. Compared with May 1951, flounder fillets were quoted 9.7 percent lower, haddock fillets 1.2 percent lower, and ocean perch 2.4 percent lower; while shrimp prices were 3.6 percent higher.

May prices for canned fishery products were only slightly above April. The increase was entirely due to a slight rise in California tuna prices. The month's

index for this subgroup was 0.3 percent higher than in April, but 7.4 percent below May 1951. While this May's quotations for pink salmon and tuna were substantially below the same month last year (16.0 percent and 4.4 percent, respectively), prices for California sardines and Maine sardines were higher by 38.8 percent and 43.0 percent, respectively.

Table 1 - Wholesale Average Prices and Revised Indexes for Edible Fish and Shellfish, May 1952 with Comparative Data						
Group, Subgroup, and Item Specification	Point of Pricing	Avg. Prices (\$)	Indexes (1947-49 = 100)			
			May 1952	Apr. 1952	Mar. 1952	May 1951
<b>ALL FISH AND SHELLFISH (Fresh, Frozen, and Canned)</b>						
<b>Fresh and Frozen Fishery Products:</b>						
Drawn, dressed, or Whole Finfish: .....			105.8	105.2	109.5	106.7
Haddock, large, offshore, drawn, fresh .....	Boston	.11	108.2	107.4	114.4	104.2
Halibut, Western, 20/80 lbs., dressed, fresh or frozen .....	New York City	.35	106.8	106.8	108.4	92.9
Salmon, king, lge. & med., dressed, fresh or frozen .....	" " "	.54	125.9	128.7	118.6	117.5
Whitefish, mostly Lake Superior, drawn (dressed), fresh .....	Chicago	.53	130.1	179.7	161.1	106.9
Whitefish, mostly Lake Erie pound or gill net, round, fresh .....	New York City	.63	131.4	182.0	156.7	119.5
Lake Trout, domestic, mostly No. 1, drawn (dressed), fresh .....	Chicago	.50	101.4	137.3	133.2	85.6
Yellow pike, mostly Michigan (Lakes Michi- gan & Huron), round, fresh .....	New York City	.44	102.0	93.8	155.9	93.5
<b>Processed, Fresh (Fish and Shellfish):</b>			99.2	101.1	111.5	101.6
Fillets, haddock, small, skins on, 20-lb. tins .....	Boston	.30	100.4	97.0	115.7	100.8
Shrimp, lge. (26-30 count), headless, fresh or frozen .....	New York City	.56	88.5	93.3	110.7	93.5
Oysters, shucked, standards .....	Norfolk area	4.50	111.3	111.3	111.3	111.3
<b>Processed, Frozen (Fish and Shellfish):</b>			102.3	103.8	109.6	104.9
Fillets: Flounder (yellowtail), skinless, 10-lb. pkg. ....	Boston	.37	129.7	136.7	136.7	143.7
Haddock, small, 10-lb. cello-pack .....	"	.24	89.3	91.1	113.4	90.4
Ocean perch (rosefish), 10-lb. cello-pack .....	Gloucester	.23	110.7	110.7	113.2	113.4
Shrimp, lge. (26-30 count), 5-lb. pkg. ....	Chicago	.61	94.1	94.1	96.4	90.8
			102.2	101.9	102.2	110.4
<b>Canned Fishery Products:</b>						
Salmon, pink, No. 1 tall (16 oz.), 48 cans per case .....	Seattle	21.00	109.6	109.6	109.6	130.4
Tuna, light meat, solid pack, No. 1 tuna (7 oz.), 48 cans per case .....	Los Angeles	14.35	89.6	89.0	89.0	93.7
Sardines (pilchards), California, tomato pack, No. 1 oval (15 oz.), 48 cans per case ..	" "	9.38	109.4	109.4	109.4	78.8
Sardines, Maine, keyless oil, No. 1 drawn (24 oz.), 100 cans per case .....	New York City	9.65	102.7	102.7	105.9	71.8
/ REPRESENT AVERAGE PRICES FOR ONE DAY (MONDAY OR TUESDAY, IF AVAILABLE) DURING WEEK BEGINNING MAY 12. PRICES ARE NOT THE ACTUAL ONES USED TO COMPUTE THE INDEXES. THE PRICES USED FOR THIS PURPOSE ARE CARRIED OUT TO THE DECIMAL PLACES.						

1/REPRESENT AVERAGE PRICES FOR ONE DAY (MONDAY OR TUESDAY, IF AVAILABLE) DURING WEEK BEGINNING MAY 12. PRICES ARE NOT THE ACTUAL ONES USED TO COMPUTE THE INDEXES SINCE THE PRICES USED FOR THAT PURPOSE ARE CARRIED OUT TO TWO DECIMAL PLACES.

**RETAIL PRICES, MAY 1952:** Although retail prices of foods bought by moderate-income urban families continued to rise, prices of all finfish products continued to decline. The food index on May 15, 1952, was 230.8 (1935-39=100), 1.5 percent higher than a year earlier and 0.3 percent above the previous month (see table 2). On the other hand, all finfish, in mid-May retailed 2.2 percent below the same period last year and 0.3 percent lower than on April 15, 1952. Lower prices were mainly attributable to a decline in canned fish prices.

Table 2 - Adjusted Retail Price Indexes for Foods and Finfish, May 15, 1952, with Comparative Data				
Item	Base	I N D E X		
		May 15, 1952	Apr. 15, 1952	May 15, 1951
All foods	1935-39 = 100	230.8	230.0	227.4
All finfish (fresh, frozen, and canned)	do	345.3	346.3	353.1
Fresh and frozen finfish	1938-39 = 100	295.1	295.5	287.1
Canned salmon: pink	do	456.7	459.3	511.7

Retail prices for fresh and frozen finfish from April 15 to May 15 dropped only 0.1 percent, but they were still 2.8 percent above mid-May 1951. Canned pink salmon prices, which started to decline in March this year, dropped even lower and in mid-May were 0.6 percent lower than the previous month and 10.7 percent below the same month in 1951.

Table 3 - Average Retail Prices and Price Ranges of Individual Finfish Products, April 15, 1952, with Comparative Data

Product	Unit	UNITED STATES		
		Range of Prices May 15, 1952	Average May 15, 1952	Average Apr. 15, 1952
		\$	\$	\$
Frozen Finfish Fillets:				
Ocean perch <sup>1</sup> .....	lb.	29-59	46.1	46.4
Haddock <sup>2</sup> .....	lb.	29-69	50.6	50.7
Canned Finfish:				
Salmon, pink .....	16-oz. can	39-79	56.5	56.8

<sup>1</sup>/PRICED IN 46 CITIES OUT OF 56.

<sup>2</sup>/PRICED IN 47 CITIES OUT OF 56.

On May 15 frozen ocean perch fillets retailed at an average of 46.1 cents and frozen haddock fillets at an average of 50.6 cents per pound. During the same month the previous year frozen ocean perch fillet retail prices averaged 46.2 cents and frozen haddock fillet prices 50.2 cents per pound (see table 3). Canned pink salmon retailed on May 15 at an average of 56.5 cents per 16-oz. can, compared with 63.3 cents per can in mid-May last year.



## FISH ON TELEVISION

Fish and shellfish television advertising has gained greatly in popularity in the past year. Some dealers who first used spot ads have become sponsors of weekly 15-minute or half-hour programs. A few producers have even gone national by becoming co-sponsors of network television programs.

The tuna industry has become a leader in television use, with major emphasis being placed on spot ads on practically every TV station in the country. In addition, tuna canners have secured TV showings of motion pictures of their industry. Shrimp packers also made greater use of TV in the past year, with a national jackpot-quiz show being among the programs carrying shrimp advertising. Sardines and cod are other species which have been promoted on TV.

Government agencies conducting consumer education programs have not neglected television. The Fish and Wildlife Service has had fishery educational motion pictures on over 95 percent of the nation's television stations. Its fishery marketing special-

ists and home economists have also appeared in person on a number of programs to teach consumers how and why fish should be used.

The Production and Marketing Administration of the U. S. Department of Agriculture has given fish and shellfish considerable time on its TV programs. These programs, both network and local, are designed to call the public's attention to those foods shown on Agriculture's Plentiful Food List. Their half-hour network show, which has been carried by 18 stations from Boston to Atlanta, and as far West as Omaha, has given fish or shellfish a place on the program nearly every week.

Television publicity serves to call the public's attention to the economy and nutritive value of fishery products at a time when the public is becoming increasingly food conscious. The entire fishing industry shares in the benefits which are gained from such advertising.

NOTE: SEE COVER PHOTO.



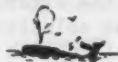


### Argentine Republic

WHALING FACTORYSHIP PURCHASED BY GOVERNMENT: Purchase of the Juan D. Peron, reportedly the world's largest whaling factoryship, was announced by the Argentine Government, states a May 22 American consular dispatch from Buenos Aires. Apparently the vessel may be leased back to its former owners.

Commissioned last year, the ship was held in port under a Government lien after entering Buenos Aires with a petroleum cargo. Further use as a tanker may be scheduled prior to whaling, since operations for the latter type of service are held up by lack of crew and killer boats.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, OCTOBER 1951, P. 22.



### Canada

REVIEW OF THE FISHERIES, 1951: A substantial improvement took place in the Canadian fishing industry during 1951, according to a February 4 American Embassy dispatch from Ottawa. Both landings and the market value of the catch established a new record. The value of exports also increased over the preceding year. Landings of commercial fish of all types are estimated to have been slightly below 1950, but the market value was about C\$196 million, an increase of C\$16 million.

The British Columbia salmon fishing was very successful and better prices were obtained than in 1950. Although exports of canned salmon decreased during 1951, domestic consumption continued the upward trend. This consumption expansion increased as much as 50 percent during the past three or four years. The East Coast lobster fishery in 1951 was about equal to the high production of the previous year.

Fresh-water fisheries continued to be important. Nearly 60 million pounds were exported to the United States in 1951. Higher prices resulted in a C\$2.3 million increase in value as compared with the previous year.

The United States is the most important export outlet for the Canadian fishing industry, taking about three-quarters of the total exports in 1951. Exports of fresh and frozen fillets (all species) have been steadily increasing in recent years.

In several respects, progress was made that improves the outlook for 1952 and subsequent years. On the Pacific Coast there was a high level of investment in boats and gear. During the 1950-51 construction season an estimated C\$2.3 million was spent for 236 boats of superior design and construction. Reduction of the U.S. duty on canned salmon at the Torquay trade negotiations in 1951 should improve the export outlook, although the increase this year was only 3,000 pounds.

Additions to the fish-processing facilities in Nova Scotia and Newfoundland may provide the basis for diversion from the traditional production of salted fish to more remunerative forms, especially fresh and frozen fillets. No price support action was taken for fish fillets in 1951. The Federal Government continued to assist fishermen in acquiring modern small dragnets and long-liners.

\* \* \* \* \*

NEWFOUNDLAND FISHERIES PLANS AND PROSPECTS: No revolutionary changes in Newfoundland as a result of the interim report of the Fisheries Development Committee are contemplated, stated the Canadian Federal Minister of Fisheries when he visited St. John's the latter part of May. (It appears that the final report of the Committee may not be made public until fall, reports an American consular dispatch from that city.) The Minister said that recommendations contained in the interim suggestions proposed by the Committee were being considered but that no plans were being made for large-scale activities during the present season.

The Minister suggested that experimental work now going on be continued, and in this connection said plans were now to go ahead with the erection at Bonavista of a pilot plant to test equipment for drying light-salted cod. Bonavista had been chosen since electricity, steam, suitable buildings, and cold-storage facilities were available there. Should the experiments now being carried out prove successful, the Minister believed the solution of a number of local fishery problems would be possible. Experimentation with the use of long-liners, which have been operating successfully off Bonavista for the past two years, will be continued.

The hydrographic survey, presently conducted by the Department of Mines and Resources, would be continued to include an examination of the sea bottom to determine good spots for long-lining, dragging, and other fishing methods. He praised the work of the Committee and stressed that it had collected a very large amount of information and was now engaged in drawing up a final report on which future development plans would be based.

He added that the matter of unemployment insurance for fishermen "was under consideration" and was being discussed with the Department of Labor.

From all reports, including statements by the newly-formed Newfoundland Fishermen's Federation, there is considerable uncertainty as to the number of fishermen who will be ready this summer to undertake fishing activities. As much as a 30-percent drop in the number of fishermen who will go to sea this year, as compared with 1951, is estimated in some quarters, although it is readily admitted that until fish prices are actually established (probably the first part of June) no prophecy can be of particular value.

There is so far little to indicate that the 1952 production will be large, and in all probability a greater number of Newfoundland fishermen will seek land employment this summer than at any time in the past.



## Chile

**MARINE OIL PRODUCTION, 1951:** Chile's production of whale and sperm oil in 1951 is estimated at about 5,800 short tons, or slightly above the 5,640-ton output of 1950, reports the American Embassy at Santiago. The output of the large company's land station at Quintay, near Valparaiso, declined by about 5 percent from 1950, but this is believed to have been more than offset by the production of a smaller station operating near Talcahuano.

Approximately 3,800 tons or 65 percent of the total 1951 output consisted of sperm oil. In 1950 sperm oil made up almost three-fourths of the total production. Chile utilizes practically its entire production of both whale and sperm oil in the manufacture of soaps, washing powders, and margarine. Exports of whale oil in 1951, all to the United States, were reported at slightly more than one ton. No imports of whale or sperm oil were registered in 1951.

Chile also produces some 650 short tons of fish oils annually, of which about 100 tons are of medicinal quality. There is a good demand for industrial fish oils and the industry could well be enlarged beyond its present size. This probably will come about partly as the result of the rapidly growing interest in fish meal for poultry feed. Chilean fish oil, as of the last of April, was sold at 18 to 20 pesos per kilogram (7.8 to 8.6 US cents per pound).



## Denmark

**BROOK TROUT EXPORTS, 1951:** Total exports of brook trout by Denmark during 1951 amounted to 5,434,000 pounds, valued at US\$1,695,274. Of this amount 22.6 percent or 1,228,400 pounds (valued at US\$475,840) were exported to the United States, according to Danish statistics.

Practically all brook trout produced in Denmark are for export. All are hatchery fish raised in dirt ponds, and the principal food used, as far as is known, is small scrap fish from the commercial fishing fleet. The cost of the scrap fish is currently reported to be about 1.3 US cents per pound.



## Ecuador

**TERRITORIAL WATERS DEFINED:** An Executive Decree issued on January 29 prohibits fishing by foreign flag vessels in Ecuadoran territorial waters, defined as the region within a 12-nautical-mile line drawn between the westernmost points of the Ecuadoran coast and adjacent islands, states an American consular dispatch from Quito.

Fishing is permitted in Galapagos Islands territorial waters if written license is obtained. Licenses will not be granted by radio except for extensions. All Ecuadoran boats are authorized to report violations and receive 50 percent of the fines imposed.



## India

PEARL FISHING TO BE REVIVED BY MADRAS: The Madras Fisheries Department is proposing to start pearl fishing anew off the Tuticorin Coast early next year, after a lapse of over 20 years. During the course of its periodical survey and inspection of fishing grounds on the east coast, the State Fisheries Department found that pearl oysters located ten miles off the Tuticorin coast three years ago have now spread over a wide range from Tuticorin to Rameswaram. The oysters are reported to be progressing satisfactorily, reports an American consular dispatch from Madras dated June 12.

In order not to disturb the growth of the pearl oysters, the Department has cautioned all ships and powerboats moving about the area not to throw coal or stones over these belts. Fishing in this area will also be restricted.



## Japan

MOTHERSHIP-TYPE TUNA EXPEDITIONS TO OPERATE IN EQUATORIAL WATERS: The Japanese Ministry of Agriculture and Forestry has authorized two mothership-type tuna fleets to operate in equatorial waters in the vicinity of the Celebes Sea and eastward of the Solomon Islands, reports a June 4 American Embassy dispatch from Tokyo. The permits were granted on May 22 to two fishing companies.

One fleet will consist of one mothership, the Tenyo Maru (11,224 gross metric tons), and 29 catcher boats. Fishing will be in the offshore waters east and southeast of the Solomons. This fleet was scheduled to leave Japan on June 12.

The other fleet will consist of one mothership, Kaiko Maru (2,940 gross tons), and 10 catcher boats. Fishing will be in the Celebes Sea and adjacent waters. This fleet was scheduled to leave Japan on June 5.

The Japanese Fisheries Agency will require daily reports on positions and record of catches by species and weight. A research vessel will accompany each fleet.

Catcher boats will not operate within territorial limits (3 nautical miles) of any land masses and the motherships will be stationed not less than 12 miles from the shore of any islands in the region of operation.

Both Japanese companies have had previous experience in mothership-tuna operations, having operated expeditions to the region of the U. S. Trust Territory of the Pacific Islands in 1950 and 1951. The Japanese Government now permits only individual Japanese tuna boats to operate in these waters and thus prevents competition in the Trust Territory region between the mothership expeditions and individual boat operations.

Production from these expeditions will continue to contribute to domestic food requirements and products for export.

\* \* \* \* \*

GOVERNMENT RESTRICTIONS ON TUNA FISHING IN THE PACIFIC OCEAN: Owners of Japanese tuna and skipjack fishing boats were sent a notice dated April 14, 1952, outlining a Japanese Government authorized area for tuna fishing in the Pacific Ocean, reports a May 7 American Embassy dispatch from Tokyo.



A prohibited region has been established in the eastern Pacific waters. No fisheries must be operated by Japanese fishermen in the following waters: In waters east of the date line in the Pacific Ocean, waters outside of the area bounded by the lines made connecting the crossing point of Lat. 40° N. and the date line, the crossing point of Lat. 20° N. and Long. 140° W., the crossing point of Lat. 30° S. and Long. 140° W. and the crossing point of Lat. 30° S. and the date line.

The restriction became effective on April 28 and is to continue until such date as decided by the Japanese Minister of Agriculture and Forestry. The Japanese Government hopes that this temporary restriction on Japanese tuna fishing will contribute toward international good will as well as aid in negotiating fisheries treaties between Japan and countries having an interest in the high-seas fisheries and in the area where tuna fishing is conducted in the Pacific Ocean.

\* \* \* \* \*

CANNED TUNA CHECK PRICES REVISED: Revisions in the check prices of Japanese canned tuna and bonito were announced in the Japanese press (Suisan Tsushin) on May 22 and were confirmed by an official of the Ministry of International Trade and Industry, states an American Embassy dispatch from Tokyo. Check prices are in effect floor prices. The Government may disapprove applications for export of these products if the prices are below the check prices. Check prices are intended to prevent dumping of cheaply-priced items in foreign markets and to stabilize export prices. The revised prices for the month of June were decided by the Canned Tuna Department of the Export Control Ordinance Executive Committee. This committee consists of two sections: one dealing with canned products, and the other with frozen products. The committee, composed of members of the Ministry of Agriculture and Forestry and the Ministry of International Trade and Industry, meets monthly.

The revised check prices, f.o.b. Japan, for June are as follows:

Size Can	Case Quantity	Tuna in Brine		Skipjack in Brine	
		New Price	Old Price	New Price	Old Price
		US\$	US\$	US\$	US\$
3.5 oz.	4 doz.	5.50	5.10	4.60	4.50
7 oz.	4 doz.	9.10	8.50	7.60	7.50
13 oz.	4 doz.	16.15	15.00	13.50	13.00
2 kilo.(4.4 lbs.)	1 doz.	18.30	17.00	15.40	15.00

JAPANESE GOVERNMENT



### Norway

IMPORT RESTRICTIONS TO AFFECT NORWEGIAN CANNED FISH EXPORTS: There is at present a buyers' market for Norwegian canned fishery products, according to the May issue of Tidskrift for Hermetikkindustri (a Norwegian canning industry publication). In addition, several of the most important markets have introduced import restrictions on canned fish, states an American consular dispatch from Bergen. Great Britain has reduced the total global import-quota of canned fish goods from £500,000 (US\$1,390,000) for the first half-year to £400,000 (US\$1,112,000) for the second half-year of 1952. This quota for the second half-year is even less favorable for Norway since soft herring roes, which were on the British free list for the first half-year, are now included in the total import-quota for the second half-year.

Several of the British Colonies have adopted similar import restrictions. Australia reduced imports of canned fish to 20 percent of the quantity imported during the budget-year 1950/1951. France introduced import-licensing for all goods previously on the free list, including canned shellfish.

All these restrictions will in time inevitably influence Norway's exports, although they are not as yet reflected in the present export statistics. This is mainly due to the fact that the greater part of the British quota for the first half-year was imported at the beginning of the year, and due also to the fact that British imports of soft herring roe took place, as usual, during the first months of the year while this commodity was still on the free list. Restrictions in Australia did not go into effect until March 8.

\* \* \* \* \*

CANNED FISHERY PRODUCTS EXPORTS, 1951: Norwegian exports of canned fishery products during 1951 amounted to 34,527 metric tons, valued at US\$20,447,049 (see table), according to a May 16 American consular dispatch from Bergen. Of this amount, 9,481 tons (US\$5,744,101) were exported to the United States; 7,799 tons (US\$4,067,415) to Australia; 6,494 tons (US\$4,305,197) to Great Britain; 1,860 tons (US\$1,177,949) to New Zealand; 1,193 tons (US\$977,528) to Canada; 1,104 tons (US\$543,680) to Eastern Germany; 494 tons (US\$270,787) to Western Germany; and the balance to various other countries.

Norwegian Exports of Canned Fishery Products, 1951					
Product	Quantity	Value	Product	Quantity	Value
	Metric Tons	US\$		Metric Tons	US\$
Sild (small), smoked:			Herring (Contd):		
In oil .....	12,340	6,971,488	Winter or spring,		
In tomato sauce .....	496	188,202	not smoked .....	257	69,663
Sild (small), not smoked:			Other .....	271	170,084
In oil .....	748	380,618	Mackerel .....	438	248,315
In tomato sauce .....	54	25,562	Other fish .....	972	647,753
Brisling, smoked:			Roe:		
In oil .....	5,987	5,135,393	Soft herring .....	1,470	547,753
In tomato sauce .....	485	373,876	Other .....	1,434	427,528
Brisling, not smoked ...	64	28,652	Fish balls, etc. ....	427	133,146
Herring:			Crayfish and shellfish	2,240	2,442,696
Kipperd .....	6,844	2,656,320	Total ...	34,527	\$20,447,049

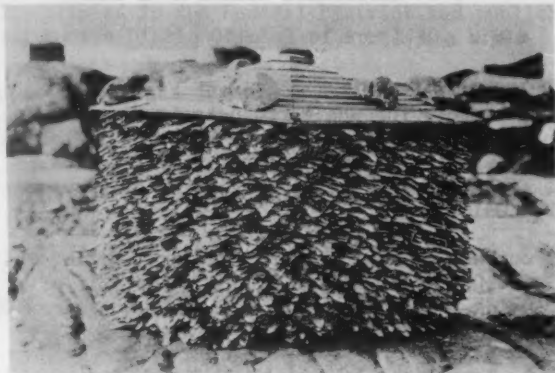
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KLIPFISH INDUSTRY: Norwegian exports of klipfish ("klippfisk") will reach an estimated total of 51,000 metric tons during the 1952-53 season as compared with nearly 53,000 tons in the 1951-52 season, according to reports from the port of Aalesund, announces a June 19 news release from the Norwegian Information Service. (Klipfish is cod that has been salted and sun-dried on the smooth rocks of the Norwegian shore.) Assuming that the price remains stable on the world market, the season's production will earn an income of about 170 million kroner (US\$23,800,000).

Traditionally, klipfish produces between 10 and 20 percent of the Norwegian fishing industry's foreign-exchange earnings, rising from a mere 119 million kroner (US\$16,660,000) in 1947 to 173 million (US\$24,220,000) last year. Nearly 28,000 tons of the 1951-52 production were sold to Brazil. Other major buyers are Spain, Portugal, Cuba, and the republics of South America.

A characteristic feature of Norwegian klipfish production is that 90 percent of the output is dried by being exposed to sun and wind. But first the cod is thoroughly saturated with salt. The greater part of the output is processed in

the western Møre districts, near Aalesund. Here the coast line consists of smooth, flat rocks that provide an ideal drying ground. Other processing centers are located in North Trøndelag province and in the Saltendistrict, further north.



THE KLIPFISH IS CAREFULLY STACKED BETWEEN SPELLS OF EXPOSURE TO THE SUN.

right appearance and the desired degree of dryness. The fish is then taken to warehouses equipped with special drying rooms and cold storage.

There are four main qualities of klipfish, with subsidiary grades chiefly based on the thickness and size of the fish. Moreover, a clear distinction is made between no fewer than six different degrees of dryness, each designed to meet the requirements of various markets. Norwegian klipfish is today sold in about 50 countries in all parts of the world, and every market has its special preferences.

All Norwegian klipfish exports are subject to rigid control by Government inspectors who check every shipment to make sure that it conforms with the stipulated requirements as to quality, dryness, and size. The Government inspector affixes an official seal to every package, box, or bundle shipped abroad to certify that the product has been checked and approved. A grader's certificate also accompanies each shipment. Moreover, every parcel is provided with the mark of the Klippfish Association as additional guarantee that the shipment conforms with the terms of the contract.

Most of the raw material for Norway's klipfish production is provided by the famous Lofoten cod fisheries. Other sources are the fisheries along the coast of Finnmark, the northernmost province in Norway. The importance of the klipfish industry to the coastal population is indicated by the fact that this year, for instance, an estimated 50 percent of the total fish catch, not including herring, will be processed into klipfish.

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INCREASE IN OFFICIAL WHALE OIL PRICE: The Price Directorate in Oslo has agreed to raise the maximum price for whale oil from £70 (US\$195) to £90 (US\$250) a long ton, according to The South African Shipping News and Fishing Industry Review of May 1952. Norwegian whaling companies will receive this price for the 40,000 tons of whale oil sold in Norway to meet domestic requirements.

An official of the Price Directorate explains that the higher price has been approved owing to the considerable increase in operating costs. He also points out that whale oil this year is bringing a poor price on the export market. Because

of the fall in the price of whale oil abroad, Norwegian whaling companies have sold only about 75,000 of the 175,000 tons of last season's production, and are storing the rest.

\* \* \* \* \*

CONVERSION OF WHALING FACTORYSHIPS TO TANKERS: The present high rates being paid on tanker tonnage and the poor prospects for whale products is tempting Norwegian whaling companies to abandon whaling and convert their floating factories into tankers. The construction of the whaling factories lends itself to conversion which is practical both from a financial and engineering point of view, points out an American Embassy dispatch from Oslo.

The exorbitant cost of fitting out and operating a fully modern whaling expedition (estimated at between US\$9,000,000 and US\$10,000,000 for one unit of a factory and fleet of catchers) is causing the operators to seriously consider withdrawing for a season or two, some even permanently.

One Norwegian company has already decided to dispose of its fleet of whale catchers and to convert its factoryship into a tanker. The prices available for catchers is good and sales possibilities numerous.

At the rates presently being obtained on whale oil the operators insist that they can make no profit. Furthermore, the Antarctic whale-hunting season is being continuously reduced (see table).

In 1947 there were 17 factoryship and 162 catchers, while in 1951 there were 19 factoryships and 265 catchers participating in the Antarctic season's hunt. The increase in the number of catchers and use of modern techniques, such as helicopters for spotting, makes the kill far more rapid and with a fixed limit of 16,000 blue-whale units per season the hunting time is being reduced.

Length of Antarctic Whale-Hunting Season, 1947/48-1951/52	
Season	Length (No. of days)
1951/52	64 days
1950/51	78 days
1949/50	84 days
1948/49	102 days
1947/48	115 days

\* \* \* \* \*

WHALE HYPOPHYSINS CONVERTED INTO ACTH: On their recent return from the Antarctic, Norwegian and British whaling expeditions delivered about 8,000 whale hypophysins to Nyegaard & Co., Oslo, to be converted into arthritis-relieving ACTH, states the Norwegian Information Service in a June 19 news release. The supply is sufficient for a year's production.

The company's scientists have developed a new, slow-acting preparation which requires fewer injections. Formerly, arthritic cases needed four ACTH injections a day. Now, one injection every second or third day will suffice. Last fall the company donated 625,000 international units of ACTH (worth about US\$55,900) to be used for medical research in Norwegian hospitals.





## Mexico

RETAIL FISH PRICES CONTROLLED: Maximum retail prices for fresh fish were established in the Federal District and published by the Mexican Ministry of Economy in the Diario Oficial of April 30, 1952.

Maximum Retail Prices, Federal District, Mexico

Species	Pesos per kilogram	US Cents per pound	Species	Pesos per kilogram	US Cents per pound
Red snapper,			Pompano, small, whole .....	4.00	.21
Gulf:			White fish, whole .....	8.00	.42
Whole .....	8.00	.42	Mojarras,		
Sliced .....	11.00	.58	Gulf:		
Fillet .....	14.00	.74	Large, whole .....	5.00	.26
Pacific, whole .....	4.00	.21	Medium, whole .....	4.00	.21
Trout, large, whole .....	4.00	.21	Small, whole .....	2.50	.13
" small, whole .....	3.30	.17	Pacific, whole .....	4.50	.24
Pike, Light and Dark,			Sawfish, whole .....	3.50	.18
Gulf:			Perch, whole .....	4.50	.24
Whole .....	5.50	.29	" without head .....	5.00	.26
Sliced .....	8.50	.45	" fillet .....	9.00	.47
Fillet .....	10.50	.55	Lisa, whole .....	3.00	.16
Pike, Small, Gulf, whole ...	3.50	.18	Dogfish, whole .....	4.00	.21
Pompano, whole .....	6.00	.32	Porgy, whole .....	4.00	.21

## Panama

MARINE LIFE ABUNDANT IN PANAMA GULF: The Danish Navy frigate Galathea recently completed a one-day fishing trip in the Panama Gulf, reports a May 22 American consular dispatch from Panama City. This trip yielded the richest hauls of deep-sea life in its entire 60,000-mile voyage. The frigate stopped at Panama on the home run of a two-year scientific expedition during which it visited 66 foreign ports in all parts of the world in search for rare specimens of marine life.

One haul was made at a depth of 3,800 meters (13,000 feet) some 200 miles from the coast. The other, made closer to the coast, was from a depth of 1,000 meters (3,300 feet). In one of the hauls the scientists aboard the Galathea caught over 5,000 specimens of deep-sea life.

According to Dr. Anton Bruun, of Copenhagen University and one of the scientists aboard the vessel, the trade winds blowing toward the west cause an upwelling of water from a depth as great as 1,000 feet. In the sea off Panama, this mass of water, which rises to the surface, is rich in minerals; hence, rich in plant life. Because of the abundant plant life, crustaceans thrive in these waters; because of the abundance of crustaceans, fish, such as mackerel, are plentiful and, in turn, large fish are found in great numbers in Isthmian waters because of the abundance of smaller fish. The Panama Star and Herald of May 21 reported that Dr. Bruun, in explaining the value of marine scientific research, pointed out: "There may be a practical application of deep-sea research in connection with the thriving shrimp-fishing industry. If the waters of the Gulf of Panama are overfished for shrimp, research might prove that at greater depths there is an abundance of crustaceans." In Denmark, he recalled it was found that shrimp were plentiful at a depth of 500 meters (1,640 feet).

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, JUNE 1951, PP. 64-5.

## Sweden

ANOTHER FISHING VESSEL TO FISH FOR BRAZIL: Another Swedish fishing vessel has contracted to fish in Brazilian waters, according to an article in the March 27 issue of Goteborgs Handels-och Sjöfartstidning and as reported by an American consular dispatch. The fishing vessel (Neptun I), whose captain has signed a one-year contract to fish for a Brazilian canning factory, will be stationed at Rio Grande Do Sul at the mouth of the Rio Grande in southern Brazil near the boundary of Uruguay.

Two other Swedish fishing vessels had previously left for Brazil. According to reports, the fishing grounds which the vessel will exploit are about two or three hours out from the home port and at a depth of 60 fathoms. Trawling will be the type of gear used.

Built at Landskrona, Sweden, in 1948, the Neptun I measures 70 feet in length, with a 200 hp. engine, echo-sounding equipment, and wireless telephone. The vessel also is equipped with refrigerated storage space.



## Union of South Africa

VITAMIN OIL PRODUCTION DROPPED IN 1951: Production of vitamin (fish-liver) oils in the Union of South Africa continued to decline in 1951, when a total of 7.826 mm (million million) international units were produced as compared with 8.903 mm in 1950 and 16.12 mm units in 1949. Production in 1952 is expected to approximate that of the preceding year.

Virtually all the vitamin oils now produced are a byproduct of trawling operations and are purchased by two companies in Capetown. About 80 percent of the production was concentrated by one of these companies in 1951.

Sources of the oil in 1951 were as follows: shark (31 percent), snoek (11 percent), stockfish and hake (56 percent), and other fish (2 percent).

Of the total production, one of the companies estimates that 0.1 mm units is required by the local market, the remainder being available for export. The local price for crude vitamin oil is 7d. (8 US cents) per million units; refined oil 11d. (12.7 US cents); and concentrated oil from 11d. to 18d. (12.7 to 20.7 US cents) per million units, depending on degree of concentration.

The principal export outlet for crude and concentrated fish-liver oils is the United Kingdom, which in 1951 took 133,094 gallons of the 269,150 gallons of crude oil exported. Other important outlets are Germany, Australia, the United States, Belgium, Netherlands, and Italy.



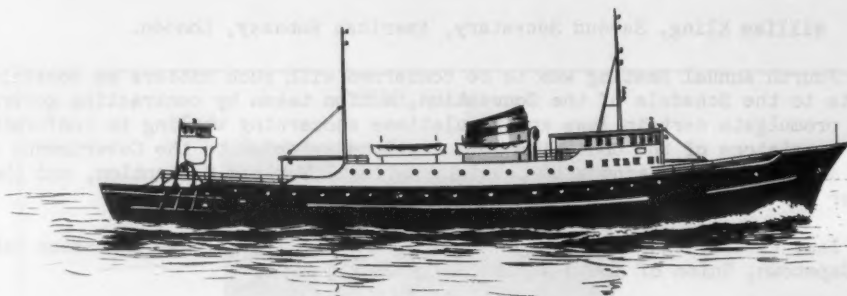
## United Kingdom

SCOTLAND TO BUILD NEW-TYPE FISH FACTORYSHIP: Work on a floating fish factoryship of new design will begin shortly at an Aberdeen shipyard, according to an April 22 American consular report from Edinburgh, Scotland. The ship is to be built for a firm in Leith, Scotland. Plans are based upon the experimental work

carried out on the factoryship Fairfree (a British Admiralty corvette which was converted to a factory trawler).

The vessel has a stern chute, similar to that of a whale factoryship, and the trawl nets will be operated through this aperture. The trawl winch is driven by a 300 hp. electric motor, but two motors are installed side by side so that either of them can be coupled to the winch drive in a matter of seconds. The nets are emptied direct into the fish pens in the factory space through hinged flush hatches in the upper deck. The factory space is equipped with machinery for washing, heading, filleting, and skinning. The fish are then weighed, wrapped, and passed through quick-freezers, then sent to storage holds on conveyor belts. The refrigerating machinery has a capacity of about 30 metric tons of fish per day. A temperature of  $-5^{\circ}$  F. in the storage holds is contemplated.

The fish offal is fed by conveyors to a fish-meal plant. A plant for extracting oil from the fish livers will also be installed.



NEW TYPE FISH FACTORYSHIP BEING BUILT IN GREAT BRITAIN. AN INTERESTING FEATURE IS A STERN CHUTE THROUGH WHICH THE TRAWL NETS WILL BE OPERATED.

The new ship is 245 feet long by 44 feet broad by 24 feet molded depth to the main deck and 32 feet molded depth to the bridge deck. Sufficient fuel is carried for a voyage of 80 days and the main power source is a 4 cylinder, 1900 B.H.P. opposed-piston marine oil engine. Two vertical boilers provide steam for operation of fresh-water evaporators, and fish-meal and liver-oil plants, as well as for hot water and central heating. Auxiliary motors are driven electrically with power provided by Diesel-driven generators.

\* \* \* \* \*

WHITE FISH AUTHORITY ARRANGES LOANS FOR NEW FISHING VESSELS: Arrangements have been made for the making of loans to assist in the building of new or there-conditioning or improvement of existing British white-fish fishing vessels, according to an announcement by the British White Fish Authority published in the May 17 issue of The Fishing News, a British fishery periodical.

It is the policy of the Authority to encourage the rebuilding of the near- and middle-water fleets by making loans for vessels (not exceeding 140 ft. in length) only in cases where the vessel to be built is to replace an old vessel which is to be scrapped. It is hoped by this means to secure the gradual rebuilding of the country's trawler fleet. A memorandum has been issued by the Authority setting out the terms upon which loans will be given.

Loans will not normally exceed 60 percent of the cost. Interest rates will range from 3 to 4½ percent.

## International

### INTERNATIONAL WHALING COMMISSION

FOURTH ANNUAL MEETING: The Fourth Annual Meeting of the International Whaling Commission convened at London, England, on June 3, 1952, the U. S. Department of State announced. The United States Delegation to the Meeting was:

United States Commissioner:

Dr. Arthur Remington Kellogg, Director, United States National Museum.

Deputy United States Commissioner:

Dr. John Laurence Kask, Assistant Director, Fish and Wildlife Service, Department of the Interior.

Adviser:

William Kling, Second Secretary, American Embassy, London.

The Fourth Annual Meeting was to be concerned with such matters as possible amendments to the Schedule of the Convention, action taken by contracting governments to promulgate certain laws and regulations concerning whaling in conformity with the provisions of the Convention, invitations extended to the Governments of Honduras and Portugal to adhere to the International Whaling Convention, and the budget for the Commission for the fiscal year beginning June 1, 1952.

The last (Third) Annual Meeting of the International Whaling Commission was held at Capetown, Union of South Africa, July 23-27, 1951.

The International Whaling Commission was established pursuant to the International Convention for the Regulation of Whaling, which was signed at Washington, D. C. on December 2, 1946 and entered into force on November 10, 1948. The United States is one of 17 contracting governments comprising the membership of this Commission. The Commission is charged with responsibility within the framework of the Convention for safeguarding the whale stocks of the world. Within strictly defined limits, the Commission may amend the Schedule, an integral part of the Convention, by adopting regulations designating protected species, fixing closed seasons and waters, limiting total catches and the sizes of whales taken, defining standards for measurement of whales, and establishing requirements for statistical and other records.



### WHALING

WHALE OIL SALES LAG: Latest indications are that some 78,000 short tons of whale oil from the 1951-52 Antarctic production still remain unsold. According to trade information available to the U. S. Department of Agriculture's Office of Foreign Agricultural Relations, Norway recently sold 44,800 tons of whale oil to Germany, the Netherlands, and France at £72-10-0 per long ton (US\$181.25 per short ton). In addition, 33,600 short tons of Norwegian whale oil are under option for



sale to domestic hardeners with no price yet determined. Quantities of whale oil remaining entirely uncommitted are approximately as follows: Norwegian--22,000 tons; Japanese--33,000; Panamanian--15,000; and Argentine--8,000 tons.

A later report (June 26) from the Norwegian Information Service indicates that all of Norway's 1952 whale oil production has now been sold. The last 10,000 long tons was purchased at 1,450 kroner (US\$203) a long ton by a British firm. The average price for Norway's 1952 total production of 170,000 tons was 1,650 kroner (US\$231) a long ton.



#### FISH SALAD



2 CUPS FLAKED CANNED TUNA  
1 CUP CELERY; DICED  
1 CUP PEAS  
1 CUP MAYONNAISE OR SALAD DRESSING

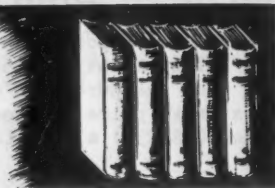
LETTUCE  
2 TABLESPOONS ONION; CHOPPED  
3 HARD-COOKED EGGS; DICED  
2 TABLESPOONS SWEET PICKLE, CHOPPED

Combine all ingredients except the lettuce, being careful not to break the fish into too small pieces. Serve on lettuce cups, and garnish with sliced eggs. Serves 6.

A Fish and Wildlife Service tested recipe. This is one in the series of recipes using fishery products tested and developed in the Service's test kitchens.



# FEDERAL ACTIONS



## Economic Stabilization Agency

### OFFICE OF PRICE STABILIZATION

SUMMARY OF REGULATIONS ISSUED JANUARY-MAY 1952: The following is a summary of orders and regulations issued by the Office of Price Stabilization from January through May 1952 of interest to the fishery and allied industries. These have not previously been reported upon in this publication. The original orders and regulations should be consulted for full details.

OPS MAJOR REGULATIONS AND THEIR PROVISIONS OF INTEREST TO THE FISHERY AND ALLIED INDUSTRIES		
SUBJECT	NO., DATE ISSUED, ETC.	SCOPE OF PROVISIONS
FATS AND OILS	CPR 6, AMDT. 12 ISSUED JAN. 24, 1952 PRESS RELEASE NO. 0-671	APPLICABILITY OF THE FATS AND OILS CEILING PRICE REGULATION (UNDER WHICH CERTAIN CRUDE FISH OILS ARE INCLUDED) TO SALES IN THE NON-CONTIGUOUS TERRITORIES AND POSSESSIONS OF THE UNITED STATES IS TERMINATED, EFFECTIVE JANUARY 29, 1952.
WHOLESALE GROCERY PRICING	CPR 14, AMDT. 11 ISSUED JAN. 24, 1952 PRESS RELEASE NO. 0-669	WHOLESALE GROCERY CEILING PRICE REGULATION IS AMENDED TO CLEARLY INDICATE HOW WHOLESALESAERS OF OWNED OR EXCLUSIVELY CONTROLLED BRANDS OF GROCERY ITEMS MAY APPLY FOR AUTHORITY TO ADD CERTAIN ADVERTISING AND SALES PROMOTION EXPENSES TO THEIR NET COST OF THESE ITEMS IN CALCULATING CEILING PRICES.
MAIL ORDER FOOD SHIPMENTS	CPR 15, AMDT. 12 ISSUED MAR. 4, 1952 PRESS RELEASE NO. 0-740	MAIL AND EXPRESS SHIPMENTS OF FOOD TO DESTINATIONS IN NORTH AMERICA EXEMPTED FROM THE RETAIL GROCERY CEILING PRICE REGULATION.
AUTHORITY TO IN-LINE CEILING PRICES	GOR 25 ISSUED MAR. 4, 1952 PRESS RELEASE NO. 0-738	CLARIFIES AUTHORITY OF THE DIRECTOR OF PRICE STABILIZATION TO ESTABLISH IN-LINE CEILINGS FOR SELLERS WHO HAVE NOT SET THEIR OWN CEILINGS IN ACCORDANCE WITH APPLICABLE CEILING PRICE REGULATIONS, AND FOR SELLERS WHOSE CEILINGS ARE NOT IN LINE.
HAWAIIAN RETAIL GROCERS	CPR 69, REV. 1, AMDT. 1 ISSUED MAR. 14, 1952 DOCUMENT ONLY	FIXES RETAIL CEILING PRICES FOR A SPECIFIC LIST OF GROCERY PRODUCTS AND PERISHABLES SOLD IN THE TERRITORY OF HAWAII BY ANY PERSON OTHER THAN THE MANUFACTURER OR PROCESSOR. EFFECTIVE MARCH 14, 1952.
WHOLESALE GROCERY ZONE DIFFERENTIALS	CPR 14, AMDT. 12 ISSUED MAR. 21, 1952 PRESS RELEASE NO. 0-761	WHOLESALE GROCERS, WHO WERE PREVIOUSLY AUTHORIZED TO ADD ZONE DIFFERENTIALS TO THEIR CEILING PRICES, ARE PERMITTED TO ADD INCREASES IN FREIGHT RATES SINCE JANUARY 1951 TO THEIR PRESENT ZONE DIFFERENTIALS.
CONSIGNMENT SALES	CPR 7, SR 1, AMDT. 9 CPR 7, AMDT. 17 ISSUED MAR. 24, 1952 PRESS RELEASE NO. 0-765	UNDER A MODIFICATION OF THE RETAIL REGULATION, A CONSIGNOR WHO CAN SHOW THAT HIS METHOD OF OPERATION IS NOT ADAPTABLE TO THE REGULATION MAY APPLY TO OPS FOR A SPECIAL ORDER. ALTHOUGH PROVISIONS MAY BE SUBJECT TO WIDE VARIATION FOR AN INDIVIDUAL CONSIGNOR, ONE EFFECT MAY BE TO PLACE RESPONSIBILITY ON A CONSIGNEE OUTLET WHEN THE OUTLET AMENDS A PRICING CHART AS FILED FOR THE OUTLET BY THE CONSIGNOR. EFFECTIVE MAR. 29, 1952.
FROZEN FOODS WAREHOUSING	CPR 16, AMDT. 12 ISSUED MAR. 26, 1952 PRESS RELEASE NO. 0-775	RETAIL FOOD STORES UNDER CPR 16 ARE AUTHORIZED TO MAKE A SPECIAL ADDITION TO THEIR NET COSTS FOR FROZEN FOODS KEPT IN WAREHOUSES BY THEM AND DELIVERED TO THEIR OWN RETAIL OUTLETS.

OPS MAJOR REGULATIONS & THEIR PROVISIONS OF INTEREST TO THE FISHERY & ALLIED INDUSTRIES (CONT.)		
SUBJECT	NO., DATE ISSUED, ETC.:	SCOPE OF PROVISIONS
TERRITORIES AND POSSESSIONS	GOR 23, AMDT. 1 ISSUED MAR. 24, 1952 DOCUMENT ONLY	THIS ACTION MAKES PLAIN THAT ALL REFERENCES IN OPS REGULATIONS, BOTH THOSE NOW IN EFFECT AND THOSE YET TO BE ISSUED, TO TERRITORIES AND POSSESSIONS MEAN ALASKA, GUAM, HAWAII, PUERTO RICO AND THE VIRGIN ISLANDS.
PRICE PROCEDURES	PPR 1, REV. 2 ISSUED APR. 28, 1952 PRESS RELEASE NO. 0-844	MISCELLANEOUS CHANGES IN PRICE PROCEDURES ARE MADE BY THIS SECOND REVISION OF PRICE PROCEDURAL REGULATION 1.
FOOD PRODUCTS SOLD IN PUERTO RICO	CPR 51, AMDT. 5 ISSUED APR. 30, 1952 DOCUMENT ONLY	PROVISION IS MADE FOR ADJUSTING CEILING PRICES OF FOOD PRODUCTS SOLD IN PUERTO RICO WHEN HARDSHIPS OCCUR.
RETENTION OF GCPR PRICES	CPR 22, SR 2, REV. 1, AMDT. 2 CPR 30, SR 1, REV. 1, AMDT. 2 ISSUED MAY 1, 1952 PRESS RELEASE NO. 0-847	THESE COMPANION AMENDMENTS PERMIT CERTAIN MANUFACTURERS UNDER CPR 22 AND CPR 30 WHO DETERMINE CEILINGS BASED ON THEIR GCPR CEILINGS RATHER THAN ON THEIR BASE PERIOD PRICES TO RETAIN THEIR GCPR CEILINGS WHERE THE CHANGE IN PRICE IS LESS THAN ONE PERCENT.
REPORTING REQUIREMENTS FOR IMPORTERS	DELEGATION OF AUTHORITY NO. 66 CPR 31, AMDT. 11 ISSUED MAY 5, 1952 PRESS RELEASE NO. 0-854	IMPORTERS, WHOLESALERS AND PROCESSORS WHO HAVE NOT ALREADY FILED DOLLARS-AND-CENTS IMPORT MARKUPS ON CERTAIN COMMODITIES THEY HANDLE MAY NOW FILE WITH APPROPRIATE OPS DISTRICT OFFICES. PREVIOUSLY, THESE FILINGS WERE TO BE MADE WITH THE NATIONAL OFFICE. EFFECTIVE MAY 10, 1952.
SUSPENSION OF APPLICATION OF CPR SALES OF NEW SHIPS BY SHIPBUILDERS	GOR 9, AMDT. 18 ISSUED MAY 12, 1952 PRESS RELEASE NO. 0-868	REMOVES FROM PRICE CONTROLS SALES OF NEW SHIPS BY MANUFACTURERS WHEN THEY ARE 65 FEET OR MORE IN LENGTH. EFFECTIVE MAY 13, 1952
TERRITORIES AND POSSESSIONS	CPR 9, REV. 1 ISSUED MAY 20, 1952 DOCUMENT ONLY	CERTAIN LIMITATIONS ARE PRESCRIBED IN THIS REVISION OF CPR 9 (TERRITORIES AND POSSESSIONS) ON THE USE OF COMPARISON COMMODITIES IN DETERMINING CEILINGS FOR SELLERS SUBJECT TO THE REGULATION. THE REVISION ALSO CLARIFIES THE DIRECT COSTS WHICH MUST BE USED IN COMPUTING CEILING PRICES FOR PURCHASES FROM NON-CUSTOMARY TYPES OF SUPPLIERS, AND MAKES THE REGULATION APPLICABLE TO SALES OF COMMODITIES NOT PRODUCED IN A TERRITORY BUT LOCATED IN THE TERRITORY AT THE TIME OF SALE, IRRESPECTIVE OF WHERE THE SALE TAKES PLACE. EFFECTIVE MAY 26, 1952.
GCPR - GENERAL CEILING PRICE REGULATION. GOR - GENERAL OVERRIDING REGULATION. PPR - PRICE PROCEDURAL REGULATION.		
CPR - CEILING PRICE REGULATION. SR - SUPPLEMENTARY REGULATION.		

NOTE: TEXTS OF ORDERS AND REGULATIONS MAY BE OBTAINED FROM THE OFFICE OF PRICE STABILIZATION, WASHINGTON 25, D.C., OR FROM THE REGIONAL OPS OFFICE IN YOUR AREA.

### WAGE STABILIZATION BOARD

**HEALTH AND WELFARE PLANS:** Regulations governing the establishment of new plans and the amendment of existing plans providing for certain health and welfare benefits were issued by the Wage Stabilization Board on December 23, 1951 (GWR 19 and Board Resolution 78). Based upon its experience in administering this policy, the Tripartite Health and Welfare Committee, established by the WSB by GWR 19, recommended to the Board the adoption of the basic policy set forth in the revision of General Wage Regulation (Res. 96) issued by WSB on June 4. The regulatory provisions of the order are concerned with new or amended health and welfare plans; extension of existing plans; procedure for modification of existing prepayment plans by an organization; plans required under Federal or state law; reporting and waiting period; Tripartite Health and Welfare Committee; and relationship to other regulations and resolutions. This revision does not affect plans in effect before January 25, 1951, or thereafter approved by the Board. Board Resolution 78 is rescinded by this revision.

For details see: GWR 19, Rev. (Health and Welfare Plans), dated June 4, 1952.

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PROCEDURES FOR ASSUMING JURISDICTION OVER EMPLOYEES WITHIN JURISDICTION OF SSB: The Wage Stabilization Board and Salary Stabilization Board today jointly announced procedures and criteria for processing requests that the Wage Board assume jurisdiction over employees within the jurisdiction of the Salary Stabilization Board.

The Wage Board policy is established in Resolution 87 and the Salary Stabilization Board has indicated its willingness to cede jurisdiction in cases falling within the limitations of that resolution.

Resolution 87 provides that requests that it assume jurisdiction be filed with the Wage Stabilization Board, Washington, D. C., which will then submit the request to the Salary Stabilization Board for its concurrence.

When the Salary Board has approved the transfer the Wage Board will assume jurisdiction if the criteria set up in Resolution 87 are met. The criteria are:

- (a) There has been a well established and maintained practice of not less than five years duration whereby the timing, amount, and nature of adjustments for employees under the jurisdiction of the SSB have been directly related to those for employees under the jurisdiction of WSB.
- (b) A majority of the employees are within the jurisdiction of WSB.
- (c) No top management officials or corporate officers subject to the jurisdiction of SSB are included.
- (d) The company states that if the request for assumption of jurisdiction is approved, such employees shall thereafter be treated in all matters involving compensation as being within the jurisdiction of the Wage Stabilization Board and not within the jurisdiction of the Salary Stabilization Board.



### Interstate Commerce Commission

ORDER FOR LOADING FREIGHT CARS WITH CANNED GOODS AND FOODSTUFFS EXTENDED AGAIN: Interstate Commerce Commission Service Order 878, prescribing minimum loading requirements for canned goods and foodstuffs in railroad freight cars, was again extended to November 30, 1952. The order was scheduled to expire May 31. The extension appeared in the Federal Register of June 4, 1952.

General permit No. 5-F (Fish Loading Requirements) was amended to provide for the extension to November 30.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, DECEMBER 1951, P. 37.



### Department of State

UNITED STATES-INDIA POINT 4 PROGRAM INCLUDES FISHERIES: Signing of the last of eleven agreements determining the final form of the Point 4 program of technical cooperation in India, toward which the United States is supplying \$50 million and India \$86 million in rupees, was announced on June 19 by the Administrator of the Technical Cooperation Administration of the Department of State.



First emphasis is upon increasing India's food supply. Included among the many projects is one in the field of marine fisheries to assist the Indians in developing this important source of protein supplement. Included in this project is a small expenditure for a dredge which alone can result in a yearly increase in the Indian fishing catch by over a million dollars. At the present time Indian fishermen in many harbors are unable to fish one week every month since the tides are too low to enable them to leave their anchorage. Once the channels in these harbors have been deepened by the dredge, a 24-percent increase in fishing time and, therefore, in the catch should result. The United States dollar allocation for fisheries is \$2,462,000.



## Eighty-Second Congress (Second Session)

JUNE 1952

Listed below are public bills and resolution introduced and referred to committees, or passed by the Eighty-Second Congress (Second Session) and signed by the President. However, the more pertinent reports, hearings, or chamber actions on some of the bills shown in this section from month to month are also listed.

### BILLS AND RESOLUTIONS INTRODUCED:

Seaward Boundaries of U. S.: H. Res. 676 (Yorty) - Resolution to authorize the Committee on Interior and Insular Affairs to investigate and study the seaward boundaries of the United States; to the Committee on Rules.

Seaward Boundary of Inland Waters: H. Res. 684 (Yorty) - Resolution relative to establishment of the seaward boundary of inland waters; to the Committee on the Judiciary.

Striped Bass Protection: H. R. 8067 (Clemente) - A bill to protect striped bass; to the Committee on Merchant Marine and Fisheries. (Would make it unlawful to take or attempt to take with or by the use of a net, seine, or any other contrivance of any kind or description, except a hook and line, any striped bass within the maritime and territorial jurisdiction of the United States.)

Tuna Industry Study: S. 3389 (Knowland, for himself, Nixon, and Magnuson) - A bill to direct the United States Tariff Commission and the Secretary of the Interior to make certain investigations with respect to the United States tuna industry; to the Committee on Finance.

Tidelands: S. 3306 (O'Mahoney, for himself and Anderson) - A bill to provide for the development of the oil and gas reserves of the Continental Shelf adjacent to the shores of the United States, to protect certain equities therein, to confirm the titles of the several States to lands underlying inland navigable waters within State boundaries, and for other purposes; to the Committee on Interior and Insular Affairs.

### BILLS PASSED:

Interior Department Appropriations: Senate passed, with amendments, H. R. 7176, Interior Department appropriations for 1953. (Includes appropriations for U. S. Fish and Wildlife Service.)

Sea Lampreys: On call of the calendar, the Senate passed and cleared for the President without amendment H. R. 6500, authorizing \$446,000 during fiscal year 1953 for investigations and studies of the sea lampreys of the Great Lakes.

Water Pollution: House passed, by voice vote, H. R. 6856, providing a 3-year extension of the Water Pollution Control Act.

### BILL SIGNED BY THE PRESIDENT:

Mutual Security Program: H. R. 7005, to extend the Mutual Security Program for fiscal year 1953. Signed June 20, 1952 (P. L. 400).

### COMMITTEE MEETINGS:

Alaska Fisheries: House Committee on Interior and Insular Affairs: Subcommittee on Territories and Insular Possessions approved for reporting to the full committee H. R. 7648, to amend the Organic Act of the Territory of Alaska to grant jurisdiction over all fishery activities to the Territory.

Defense Production Act: House Committee on Banking and Currency voted to extend the Defense Production Act for 1 year, until June 30, 1953, including rent control. Also during executive consideration of the bill (H. R. 6546) the committee eliminated Title VI of the Act, authorizing consumer credit and real estate credit controls; also authority for Voluntary Credit Committee. It adopted the Rains amendment requiring the Secretary of Agriculture to support prices of the six basic agricultural commodities at 90 percent of parity while Title IV of the DPA is in effect, except when producers have disapproved marketing quotas. In substance, the amendment would make the sliding scale provisions of Section 101 of the Agricultural Act of 1949 inoperative as long as Title IV is in effect.

Agreed to leave the so-called Capehart amendment in the bill; and agreed to leave the Herlong amendment in the bill with an amendment eliminating

the word "hereafter" and further providing that any regulations heretofore issued not in compliance therewith shall be invalidated. Committee voted 15 to 3 to report favorably to the House H. R. 6546.

Committee approved for reporting to the House H. R. 8210, a clean bill containing the amended text of H. R. 6546, the original measure which would extend price, wage, and rent controls for 1 year.

Defense Production Act: Conferees on S. 2594, amending and extending the Defense Production Act of 1950, as amended, and the Housing and Rent Act of 1947, as amended, concluded work on the differences between the Senate- and House-passed versions, and agreed to file a conference report. The major agreements of the conferees are as follows: (1) with respect to the termination of the various titles of the bill, House and Senate conferees agreed to extend the life of Titles IV (Price and Wage Stabilization) and V (Settlement of Labor Disputes) and the rent-control provisions through April 30, 1953, and to extend the other titles through June 30, 1953; (2) that OPS be required to demonstrate the validity of its regulations by "substantial" evidence instead of the requirement of a "preponderance" of the evidence; (3) to accept an amendment to the Taille food-processing amendment, which would have the effect of making perfectly clear that all food processors are entitled to the Capehart amendment and that all distributors of processed foods are entitled to the provisions of the Harlong Act.

Sea Lampreys: Senate Committee on Interstate and Foreign Commerce in executive session ordered favorably reported to the Senate without amendment H. R. 6500, authorizing \$446,000 during fiscal year 1953 for investigations and studies of the sea lampreys of the Great Lakes.

Interior Appropriations: Senate Committee on Appropriations in executive session ordered reported favorably to the Senate with amendments H. R. 7176, Interior appropriations for 1953. (This bill also contains appropriations for the U.S. Fish and Wildlife Service.)

#### CHAMBER ACTIONS:

Defense Production Act: By 58 yeas to 18 nays Senate passed with amendment S. 2594, amending and extending the Defense Production Act of 1950, as amended, and the Housing and Rent Act of 1947, as amended, after amending the bill by substituting for its text, committee amendment in the nature of a substitute, as amended. Prior to passage of the bill, Senate rejected Malone motion to recommit the bill to the Committee on Banking and Currency. Actions on further amendments to the committee amendment in the nature of a substitute were as follows: Adopted: Johnson (Texas) amendment respecting effect of State antitrust laws on retail resale prices.

Defense Production Act: Senate adopted conference report on S. 2594, amending and extending the Defense Production Act of 1950, as amended, and the Housing and Rent Act of 1947, as amended.

House by roll-call vote of 194 yeas to 142 nays also adopted the conference report on S. 2594, and thereby cleared the bill for Presidential action.

Tuna Import Duty: Senator Moore entered motion in Senate to reconsider vote by which H. R. 5693,

relation to imposition of certain duties upon the importation of fresh and frozen tuna, had been rejected on June 24.

A resolution directing the Tariff Commission to make an investigation of the domestic tuna industry, including the effect of imports of fresh and frozen tuna on the livelihood of American fishermen under provisions of Section 332 of the Tariff Act of 1930, was approved by the Senate Finance Committee on June 26 and sent to the Tariff Commission. The letter of transmittal and the resolution were ordered printed in the Congressional Record. The Tariff Commission is directed to make a thorough investigation of the domestic tuna industry and to report the results of its findings to the Senate Finance Committee on or before March 1, 1953. The letter to the Commission and the resolution follow:

The Honorable Oscar B. Ryder, Chairman,  
U. S. Tariff Commission,  
Washington 25, D. C.

Dear Chairman Ryder:

The Finance Committee today approved a resolution directing the Tariff Commission to make an investigation of the domestic tuna-fishing industry. A copy of that resolution is enclosed.

As you have been aware, the House last year passed a bill which, among other things, would have directed the Tariff Commission to carefully study this matter. That bill failed of passage in the Senate. It was brought out during the debate that the action of the Senate should probably be delayed until a thorough study had been made. The committee felt that the situation was such that an investigation by your agency would be of great help to the Congress should any future action be considered.

Sincerely yours,

(Sgd.) Walter F. George

Chairman

#### RESOLUTION:

Resolved, that the Tariff Commission is hereby directed, pursuant to section 332 of the Tariff Act of 1930, as amended (19 U.S.C. 1332) to make a thorough investigation of the domestic tuna industry, including the effect of imports of fresh or frozen tuna fish on the livelihood of American fishermen, and to report the results of its investigation to the Senate Finance Committee on or before March 1, 1953.

Sec. 2. Such investigation shall be made after due notice and opportunity for hearing is given to interested parties. The report of the Commission shall set forth the facts so determined relative to the production, trade, and consumption of tuna fish in the United States, and shall take into account all relevant factors affecting the domestic economy, including the interests of consumers, processors, and producers. Such report also shall contain a statement of findings as to the effect upon the competitive position of the domestic tuna fishing industry of the present free entry of foreign tuna, so as to assist the Congress in determining what change, if any, shall be made in the tariff status of fresh or frozen tuna.

CONGRESSIONAL REPORTS:

Committee reports on bills reported in this section of interest to the fishery and allied industries (available only from the committee submitting the report.)

Amending the Act to Extend the Provisions to Further Regulate the Interstate Shipment of Fish, House Report No. 2148 (June 11, 1952, 82d Congress, 2d Session), 3 p., printed, to accompany H. R. 5803. House Committee on Merchant Marine and Fisheries, to whom was referred H. R. 5803 (to prevent the shipment in interstate commerce of illegal undersized fish), recommended passage with amendments. Report describes purpose of the bill, and presents the report from the Department of the Interior on the bill.

Imposition of Duties on Tuna Fish, Senate Report No. 1515 (May 12, 1952, 82d Congress, 2d Session), 7 p., printed, to accompany H. R. 5693, to amend the Tariff Act of 1930, to impose certain duties on the importation of fresh or frozen tuna fish. Senate Committee on Finance reported favorably on the bill and recommended passage. The committee "recognized that the emergency found in 1951 by the Ways and Means Committee still exists in the domestic tuna

fishing and canning industry. Unemployment is widespread and operating profits are small or nonexistent." This report discusses the purpose of the bill, rates of duty on tuna fish, and presents data on the domestic tuna industry and imports of fresh, frozen, and canned tuna.

Interior Department Appropriation Bill, 1953, Senate Report No. 1803 (June 23, 1952, 82d Congress, 2d Session), 31 p., printed, to accompany H. R. 7176, making appropriations for the Department of the Interior (including the Fish and Wildlife Service) for the fiscal year ending June 30, 1953. Committee on Appropriations reported the bill to the Senate with various amendments. In this report the committee "directs the Fish and Wildlife Service to operate the Fish Market News Service at Hampton, Va., as set out in the justification material submitted to Congress in support of the budget."

Mutual Security Act of 1952, House Report No. 2031 (June 4, 1952, 82d Congress, 2d Session), 22 p., printed, to accompany H. R. 7005, to amend the Mutual Security Act of 1951. This is a report on the recommendations of the Committee of Conference regarding the amendment of the Mutual Security Act of 1951.



### FISHERIES OF FRANCE

The quantity of fresh marine fish landed in France in the years just before World War II amounted to approximately 282,000 metric tons annually, comprising 73,000 tons of herring, 35,000 tons of pilchards, 24,000 tons of mackerel, 9,500 tons of tunny and 140,000 tons of other species. In addition, approximately 70,000 tons of salt cod were produced each year by French vessels. About half of the salt cod produced was shipped to French overseas territories and countries of the Mediterranean Basin.

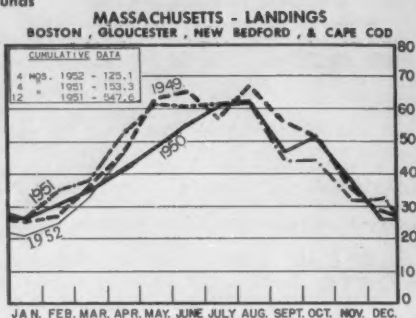
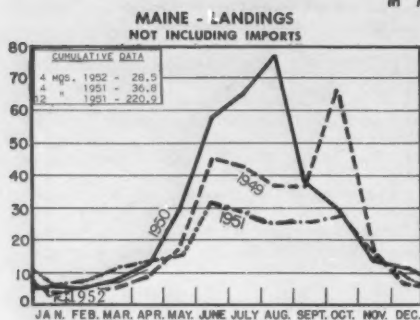
Under war conditions and in view of war destruction, the production of fresh marine fish dropped to a very low point. In 1947, however, it had reached the prewar level, and in 1948 surpassed it. While the good results obtained in the immediate postwar years were in large part due to increased productivity of fishing banks after several years of greatly reduced fishing activity, the efforts made toward reconstruction of the fleet have had increasing effect.

Production of fresh marine fish in 1948 amounted to 309,000 metric tons. The preliminary figure for 1949 is 293,000 tons or slightly below the preceding year. The slight decline may be attributed in large part to decreased yields of fishing banks, which already show the effect of increased postwar fishing activity.

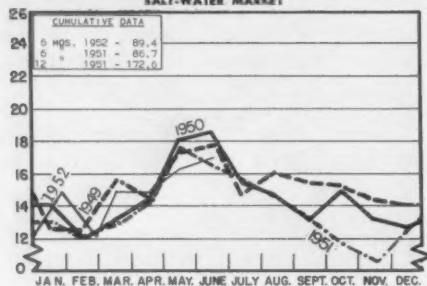
--Fishery Leaflet 381

## LANDINGS AND RECEIPTS

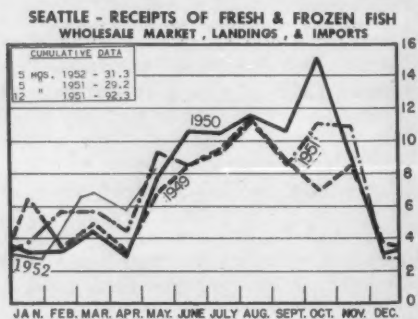
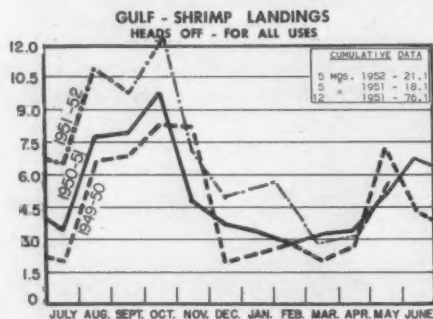
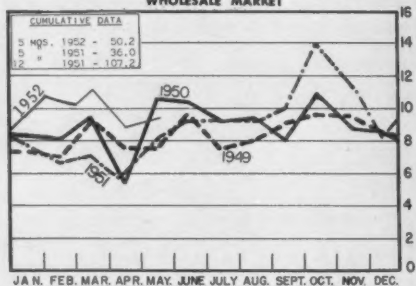
in Millions of Pounds



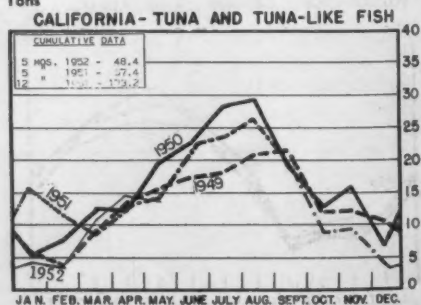
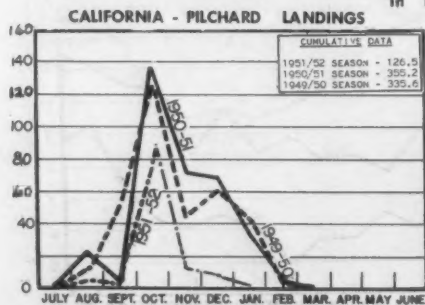
**NEW YORK CITY-RECEIPTS OF FRESH & FROZEN FISH**  
SALT-WATER MARKET



**CHICAGO - RECEIPTS OF FRESH & FROZEN FISH**  
WHOLESALE MARKET



in Thousands of Tons

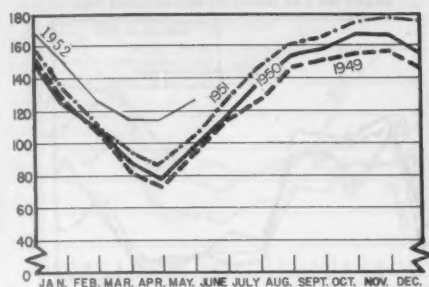




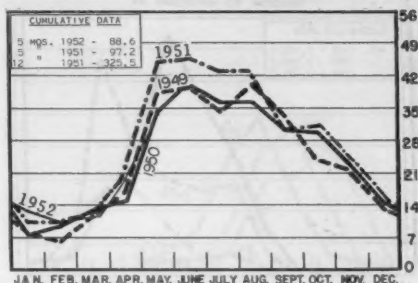
## COLD STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS

In Millions of Pounds

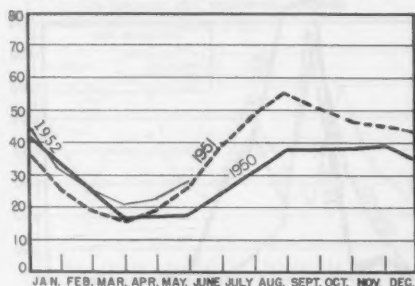
U.S. &amp; ALASKA - HOLDINGS OF FROZEN FISH



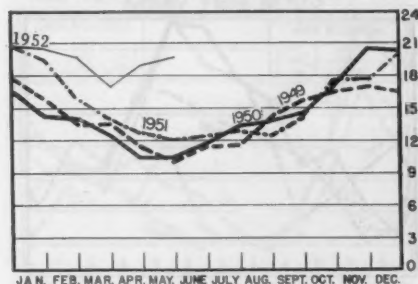
U.S. &amp; ALASKA - FREEZINGS



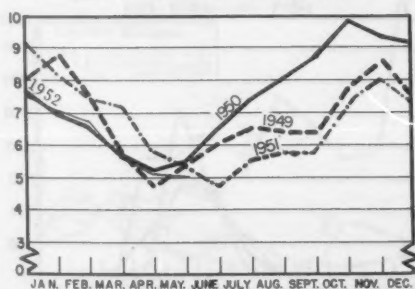
NEW ENGLAND - HOLDINGS OF FROZEN FISH



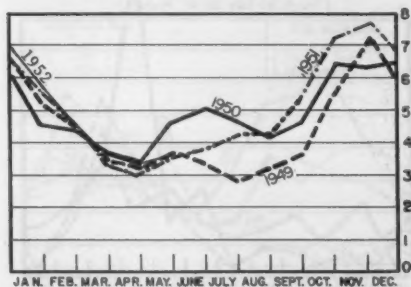
NEW YORK CITY - HOLDINGS OF FROZEN FISH



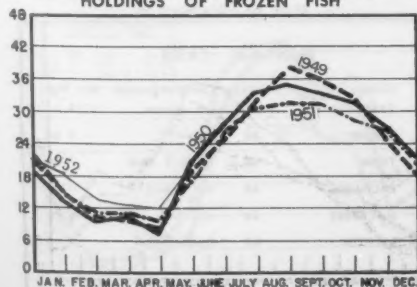
CHICAGO - HOLDINGS OF FROZEN FISH



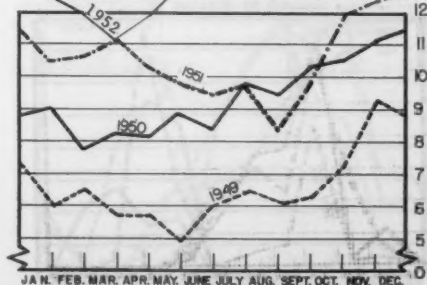
GULF - HOLDINGS OF FROZEN FISH



WASHINGTON, OREGON, AND ALASKA - HOLDINGS OF FROZEN FISH

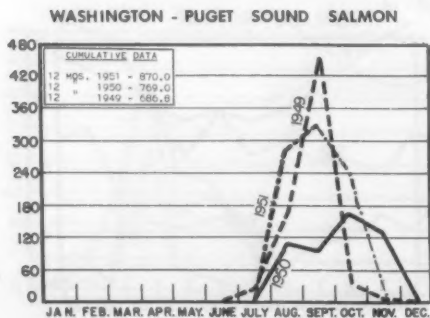
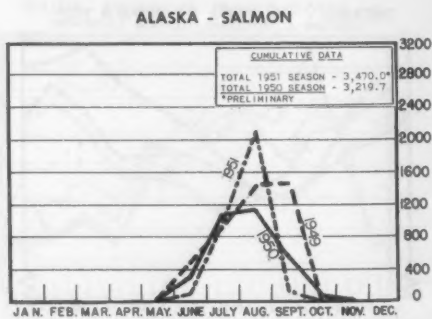
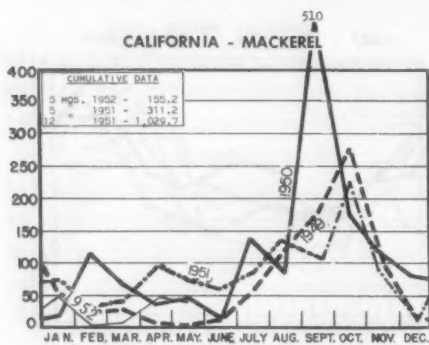
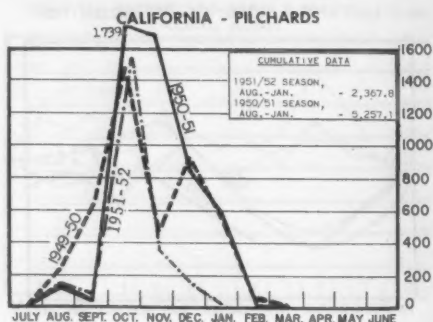
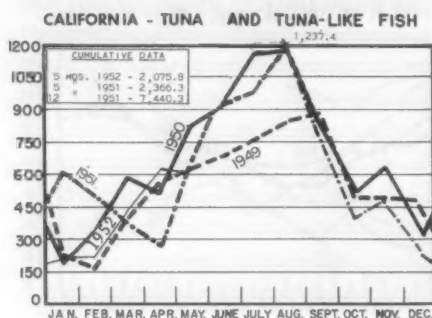
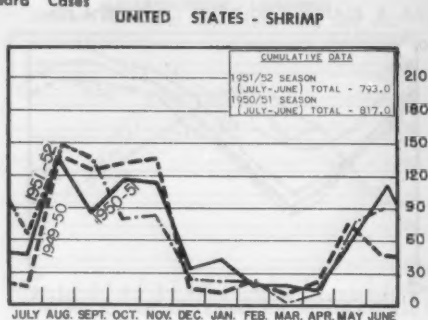
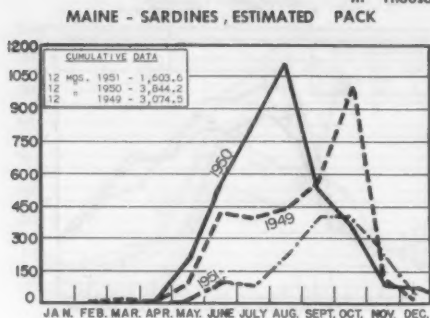


CALIFORNIA - HOLDINGS OF FROZEN FISH



## CANNED FISHERY PRODUCTS

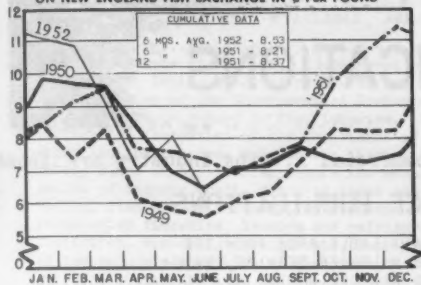
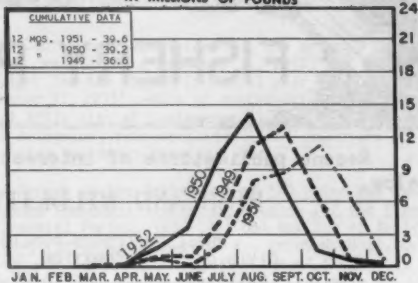
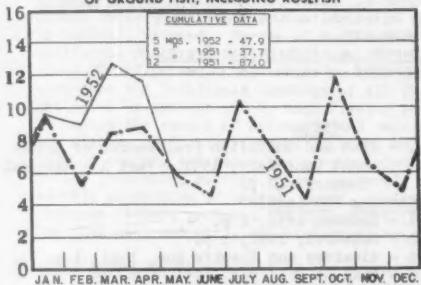
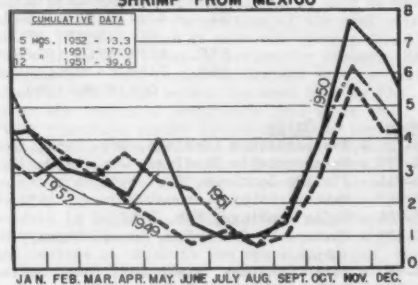
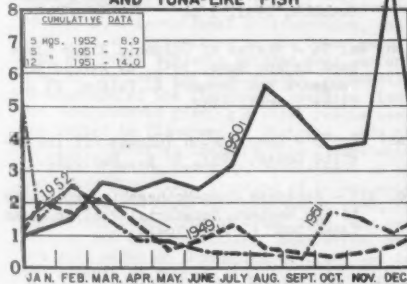
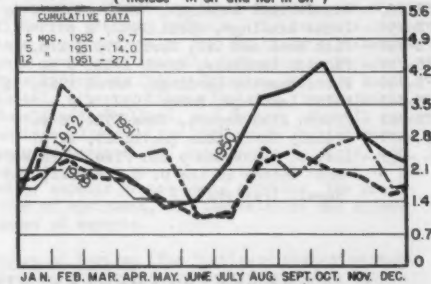
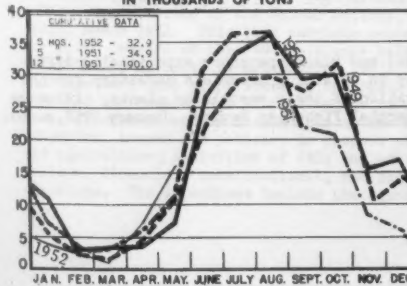
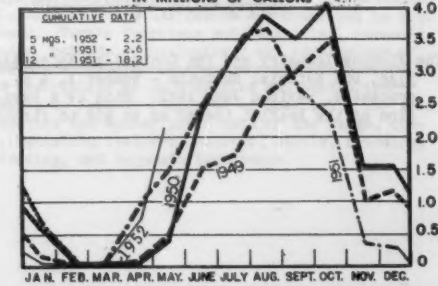
In Thousands of Standard Cases



## STANDARD CASES

Variety	No. Cans	Can Designation	Net. Wgt.
SARDINES	100	1/4 drawn	3 1/4 oz.
SHRIMP	48	—	7 oz.
TUNA	48	No. 1/2 tuna	7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
MACKEREL	48	No. 300	15 oz.
SALMON	48	1-pound tall	16 oz.

## PRICES, IMPORTS and BY-PRODUCTS

BOSTON - WEIGHTED AVERAGE PRICE  
ON NEW ENGLAND FISH EXCHANGE IN ¢ PER POUNDMAINE - IMPORTS OF FRESH SEA HERRING  
IN MILLIONS OF POUNDSU.S. - IMPORTS OF FRESH & FROZEN  
OF GROUND FISH, INCLUDING ROSEFISHU.S. - IMPORTS OF FRESH AND FROZEN  
SHRIMP FROM MEXICOU.S. - IMPORTS OF CANNED TUNA  
AND TUNA-LIKE FISHU.S. - IMPORTS OF CANNED SARINES  
(Include in oil and not in oil)U.S. & ALASKA - PRODUCTION OF FISH MEAL  
IN THOUSANDS OF TONSU.S. & ALASKA - PRODUCTION OF FISH OIL  
IN MILLIONS OF GALLONS

# RECENT FISHERY PUBLICATIONS

Recent publications of interest to the commercial fishing industry are listed below.

## FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE DIVISION OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

- CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES AND ALASKA.
- FL - FISHERY LEAFLETS.
- SL - STATISTICAL SECTION LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
- SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
- SSR - FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).

Number	Title
CFS-731	- Massachusetts Landings, Dec. 1951, 14 p.
CFS-739	- Massachusetts Landings, Jan. 1952, 12 p.
CFS-744	- Florida Landings, Feb. 1952, 6 p.
CFS-747	- Maine Landings, Annual Summary, 1951, 6 p.
CFS-748	- Maine Landings, Feb. 1952, 4 p.
CFS-749	- Chesapeake Fisheries, Annual Summary, 1950, 4 p.
CFS-750	- Texas Landings, March 1952, 4 p.
CFS-752	- Frozen Fish Report, May 1952, 8 p.
CFS-753	- Massachusetts Landings, by Ports, Annual Summary, 1951, 16 p.
CFS-754	- Massachusetts Landings, Feb. 1952, 14 p.
CFS-755	- Mississippi Landings, March 1952, 2 p.
CFS-756	- Texas Landings, April 1952, 4 p.
CFS-758	- Fish Meal and Oil, April 1952, 2 p.
CFS-759	- Florida Landings, March 1952, 6 p.
CFS-760	- Massachusetts Landings, March 1952, 14 p.
CFS-761	- Maine Landings, March 1952, 4 p.
CFS-762	- Frozen Fish Report, June 1952, 8 p.
FL-197	- Fishery Statistics (revised), 12 p.
FL-293	- List of Fishermen's and Fish Shore Workers' Unions in the U. S., Alaska, and Hawaii (revised), 7 p.

Number	Title
FL-407	- Fish and Shellfish Preferences of Household Consumers, 1951. Part 1 - National Summary, 47 p.
<b>Firms Canning (Revised):</b>	
SL-101	- Salmon, 1951, 4 p.
SL-104	- Mackerel, 1951, 1 p.
SL-105	- Alewives and Alewife Roe, 1951, 1 p.
SL-106	- Shad or Shad Roe, 1951, 1 p.
SL-112	- Shrimp, 1951, 2 p.
SL-116	- Food For Animals, From Fishery Products, 1951, 1 p.
SL-155	- Firms Manufacturing Marine Pearl-Shell Buttons, 1951, 1 p.
SSR-Fish. No. 74	- Status of Columbia River Blueback Salmon Runs, 1951, by Harold A. Gangmark and Leonard A. Fulton, 29 p., illus., April 1952.
SSR-Fish. No. 73	- Zooplankton Volumes Off the Pacific Coast, 1951, 37 p., May 1952.
Sep. No. 315	- Japanese Tuna-Mothership Expedition in the Western Equatorial Pacific Ocean (June 1950 to June 1951).

## DEFENSE FISHERIES ADMINISTRATION PUBLICATIONS

THE FOLLOWING PUBLICATION IS AVAILABLE FREE FROM THE DEFENSE FISHERIES ADMINISTRATION, U. S. DEPARTMENT OF THE INTERIOR, WASHINGTON 25, D. C.

The Fishing Industry and The Controlled Materials Plan, DFA Material Bulletin - Number 1, 4 p., processed, revised June 1952. This is a revision of the leaflet issued as an aid to fishing

vessel and plant operators experiencing difficulty in obtaining materials necessary for the operation of their vessels or plants. (Also see Commercial Fisheries Review, January 1952, p. 55).

## MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE AGENCIES OR PUBLISHERS MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

Bombay Marches On... Fisheries, 25 p. illus., printed. Directorate of Publicity, Government of Bombay, Bombay, India, 1952. A review of the work and activities of the Government of Bombay during 1946-1951 in regard to its fisheries. Describes the foundation of the Department of Fisheries and the progress made in the fishing industry since 1946. It also covers the mechanization of fishing craft, grant of loans and subsidies, fish-curing industry, development of fresh-water fisheries, landing and refrigeration facilities, marketing arrangements, improvement of the economic condition of fishermen, fisheries schools, and progress in scientific investigation and research.

(California) Statistical Report of Fresh and Canned Fishery Products (Year 1951, including Sardine Season 1951-1952), Circular No. 26, 21 p. (mostly tables), printed. Bureau of Marine Fisheries, California Division of Fish and Game, San Francisco, Calif., 1952. The tables in this publication show the California landings of all fish and shellfish by species and by main fishing areas, including the amount of pilchards and tuna landed; fishery products shipments into the State; a list of canning and reduction plants (plants primarily processing sardine, tuna, mackerel, and squid); production of canned, cured, and manufactured fishery products and byproducts (including fish meal and oil); and historical data.

(Ceylon) Administration Report of the Acting Director of Fisheries for the Years 1940 to 1950 (Part II-1948 to 1950), by E. R. A. de Zylva, 62 p., printed. Government Publications Bureau, Colombo, Ceylon, February 1952. This report covers the reorganization of the Fisheries Department of Ceylon, international collaboration, and the functions and activities of the Department. Among the other subjects covered are: enforcement of the laws and regulations, cooperative development of the fisheries, loans to fishermen and unregistered fishing groups, rescue services and relief to fishermen in distress, aids to navigation, fisheries training school, mechanization of local fishing industry, development of brackish-water fisheries, stocking of inland waters with local and imported fresh-water fish, fish marketing, production of dried fish, and refrigeration and transportation. Statistical data are also given on production of fish, and imports and exports of fishery products and byproducts.

(FAO) Report of the 6th Session of the Conference (19 November-6 December 1951), 214 p., printed in English, French, and Spanish. Food and Agriculture Organization of the United Nations, Rome, Italy, March 1952. This is a complete report on the Sixth Session of the FAO Conference held in Rome, Italy, November 19-December 6, 1951. In addition to a list of officers of the Sixth Session and the resolutions adopted by the Conference, it reports on the discussions of the world situation, trends and policies in respect of food and agriculture; activities of FAO; and administrative, financial, constitutional, and legal questions. The appendices include the agenda of

the Conference; the budget for the seventh financial year (ending December 31, 1952) and the budget for the eighth financial year (ending December 31, 1953); scale of contributions for 1952 and 1953; list of Conference documents; a list of delegates, representatives, and observers attending the Sixth Session; etc.

(FAO) Report on the Activities of FAO under the Expanded Technical Assistance Program for the First Financial Period, 1950-1951 and Outline of Activities for 1952, 76 p., illus., printed, US\$1.00. Food and Agriculture Organization of the United Nations, Rome, Italy, May 1952. (For sale by International Documents Service, Columbia University Press, New York 27, N. Y.) The introduction points out that "the exploratory and experimental phase of technical assistance may be said to have passed and with the recognition of the continuing nature of the program it must now advance from the phase of study to that of action for economic development." This report is divided into two parts, of which the first covers the work done by FAO under the technical assistance program in the first financial period (October 1950 to December 31, 1951) and the second deals briefly with plans and projects for 1952. Part I first considers a number of selected individual projects in some detail, then provides a statistical summary (up-to-date to March 31, 1952), and finally considers the program as applied in the various countries and regions in which it has operated during the period under discussion. Among the list of selected projects discussed are fish culture in Haiti and Karachi's (Pakistan) new fish harbor. Also covered are fisheries development in Ceylon, India, Israel, Liberia, and Pakistan; fisheries research in Chile; the Latin American and Manila fisheries training centers. Fisheries is listed as a major subject in the FAO technical assistance agreements with the following countries: Brazil, Ceylon, Chile, Ecuador, Finland, Haiti, Israel, Liberia, Libya, Pakistan, Saudi Arabia, Somaliland, Thailand, and Turkey. Part II summarizes activities for 1952, with special reference to regional and large-scale projects, and also discusses general policy with regard to two major aspects of the whole program: the provision of equipment, and the salaries and allowances of experts.

Handbook of Turtles (The Turtles of the United States, Canada, and Baja California), by Archie Carr, 557 p., illus., printed. Cornstock Publishing Associates (A Division of Cornell University Press), Ithaca, N. Y., 1952. About 79 species and subspecies of turtles that inhabit the United States, Canada, and Baja California are described in this book. Turtle functions and capacities, economic uses, methods of collecting, and terminology of turtle structures make up Part I (Introduction). A description of each species and subspecies makes up Part II (Accounts of Species). For each species the author gives data on the range, distinguishing features, habitat, habits, breeding, feeding, and economic importance.



THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILD-LIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE AGENCIES ISSUING THEM.

A High Speed Manual Commercial Fishing Reel, by J. B. Siebenaler and Winfield Brady, Technical Series No. 4, 11 p., illus. Marine Laboratory, University of Miami, Coral Gables, Fla. (Available from State Board of Conservation, Tallahassee, Fla.) The need for a low-cost reel has been apparent for some time in the red snapper and other hand-line fisheries of Florida and the Gulf of Mexico, state the authors. This booklet describes a high speed manual commercial fishing reel used extensively in the Fort Pierce area. Many fishermen in the area consider the reel to be an effective and essential part of their gear. The vessels using the reels range from 30 to 45 feet in length and fish in depths from 45 to 60 fathoms. Each boat is equipped with a depth-recorder and an average of three manual reels. The crew consists of 2 to 4 men. The potential use of the manual reel is also discussed.

The Hilsa Fishery of the Chilka Lake, by S. Jones and K. H. Sujansingani, 17 p., illus. (Reprinted from the Journal of the Bombay Natural History Society, vol. 50, no. 2, December 1951.) Central Inland Fisheries Research Station Barackpore, via: Calcutta, India. The city of Calcutta draws an appreciable part of its fish supply from brackish-water Chilka Lake, according to the authors. This report discusses certain observations made on the biology and fishery of the Indian shad (Hilsa ilisha, Hamilton). The fishery is described. Discussed are the seasonal fluctuations and crop movements in relation to physico-chemical changes; size groups and sexes; bionomics; food; coastal fishery of hilsa and its bearing on Chilka stocks; and suggestions for the conservation of the fishery.

Observations on the Life-History, Bionomics and Fishery of the Gangetic Anchovy, SETIPINNA PHASA (Hamilton), by S. Jones and P. M. G. Menon. (Reprinted from the Journal of the Zoological Society of India, vol. 3, no. 2, February 1952.) Central Inland Fisheries Research Station, Barackpore, via: Calcutta, India. The Gangetic anchovy, Setipinna phasa (Hamilton) (popularly known as the phasa) forms one of the major items of the fishermen's catches from November to March-April in the tidal zone of the Hooghly River. The fish is distributed in the estuaries and rivers of Bengal and Burma, and abounds in the deltaic branches of the Ganges and is caught far above the tidal limits. This paper, which was also presented at the Third Meeting of the Indo-Pacific Fisheries Council, Madras (1951), discusses the breeding season and spawning time; embryonic development; larval development; bionomics; and the fishery.

Study on the Ultrasonic Echo-Sounder, Fish-Finder and its Applications, Fishing Boat Series II, 150 p., printed in Japanese with English summary. Fisheries Agency, Tokyo, Japan, December 1951. The foreword states: "The introduction of the fish-finder into the Japanese fishing industry which had been lagging behind the modern development of science seemed to have given animation to the modernization and scientification of our fishing technique." Results of practical echosounder experiments begun in 1950 by the Japanese Fishing Boat Laboratory are described under the following chapter headings: application of echo-sounding method to the study of the life of fish; the characteristics of ultrasonic sound-wave propagation in a horizontal direction at sea water and in a vertical direction to water surface; the installation of the echo-sounder and fish finder; the ultrasonic transducer; the recording paper; and applications of ultrasonic sound waves.

World Fisheries Year-Book and Directory 1951 (Incorporating the North Atlantic Fisheries Year-Book and the Herring Exporters Manual), edited by Harry F. Tysser, 439 p., printed, illus. British-Continental Trade Press Ltd., 222 Strand, London, England. The first part of the book consists of editorial articles on the world's fisheries and fish-processing industries and trades. The second half of the book is a directory which lists names, addresses, and other particulars on firms in various branches of the fishery industries, grouped by countries. The lists included are: (1) exporters and curers, quick freezers, tawler owners; (2) importers and wholesalers; (3) fish canners; (4) machinery and equipment for fish processing, refrigeration, etc.; (5) packing machinery, materials, etc.; (6) supplies for fisheries; (7) fish byproducts; (8) cold storage and transport. Also included is a list of trade marks and names and a buyers' guide and classified list of advertisers. The articles which make up the first part of the book cover the following subjects: The British Fishing Industry; Colonial Development Corporation's Report; Icelandic Fisheries and Exports; Danish Supplies Maintained; The Year in Western Germany; United States Production, Exports and Imports; Around the World covers the fisheries of the more important countries; Trawl Fishing; Common Salt; Research Activities the World Over; Processing of Fish; Canned Fish; Dictionary of Fish Names; Fish Supplies Calendar; Fishing Vessel Construction; Radio Equipment for Fishing Vessels; Aluminum and Fish; Solvent Extraction of Oils from Fish Meal; Drying Marine Products with Infra-Red Rays; More Meal from Fisheries Waste. In addition, the book gives a list of organizations and trade associations and a list of trade journals of interest to the fishery industries and the fish trade.



## CONTENTS, CONTINUED

	PAGE		PAGE
FOREIGN (CONTD):		FEDERAL ACTIONS:	48
NORWAY:		ECONOMIC STABILIZATION AGENCY:	
IMPORT RESTRICTIONS TO AFFECT NORWEGIAN		OFFICE OF PRICE STABILIZATION:	
CANNED FISH EXPORTS .....	39	SUMMARY OF REGULATIONS ISSUED JANUARY-	
CANNED FISHERY PRODUCTS EXPORTS, 1951 ..	40	MAY 1952 .....	48
KLIPFISH INDUSTRY .....	40	WAGE STABILIZATION BOARD:	
INCREASE IN OFFICIAL WHALE OIL PRICE ..	41	HEALTH AND WELFARE PLANS .....	49
CONVERSION OF WHALING FACTORYSHIPS TO		PROCEDURES FOR ASSUMING JURISDICTION	
TANKERS .....	42	OVER EMPLOYEES WITHIN JURISDICTION	
WHALE HYPOPHYSINS CONVERTED INTO ACTH ..	42	OF SSB .....	50
MEXICO:		INTERSTATE COMMERCE COMMISSION:	
RETAIL FISH PRICES CONTROLLED .....	43	ORDER FOR LOADING FREIGHT CARS WITH	
PANAMA:		CANNED GOODS AND FOODSTUFFS EXTENDED	
MARINE LIFE ABUNDANT IN PANAMA GULF ...	43	AGAIN .....	50
SWEDEN:		DEPARTMENT OF STATE:	
ANOTHER FISHING VESSEL TO FISH FOR		UNITED STATES-INDIA POINT 4 PROGRAM	
BRAZIL .....	44	INCLUDES FISHERIES .....	50
UNION OF SOUTH AFRICA:		EIGHTY-SECOND CONGRESS (SECOND SESSION),	
VITAMIN OIL PRODUCTION DROPPED IN 1951	44	JUNE 1952 .....	51
UNITED KINGDOM:		GRAPHS: .....	54
SCOTLAND TO BUILD NEW-TYPE FISH		LANDINGS AND RECEIPTS .....	54
FACTORYSHIP .....	44	COLD STORAGE HOLDINGS AND FREEZINGS OF	
WHITE FISH AUTHORITY ARRANGES LOANS FOR		FISHERY PRODUCTS .....	55
NEW FISHING VESSELS .....	45	CANNED FISHERY PRODUCTS .....	56
INTERNATIONAL:		PRICES, IMPORTS, AND BYPRODUCTS .....	57
INTERNATIONAL WHALING COMMISSION:		RECENT FISHERY PUBLICATIONS: .....	58
FOURTH ANNUAL MEETING .....	46	FISH AND WILDLIFE SERVICE PUBLICATIONS ..	58
WHALING:		DEFENSE FISHERIES ADMINISTRATION	
WHALE OIL SALES LAG .....	46	PUBLICATIONS .....	58
		MISCELLANEOUS PUBLICATIONS .....	59



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Compositors--Jean Zalevsky, Betty Coakley, Irene Mainster

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INTERIOR--DUPLICATING SECTION, WASHINGTON, D.C., JOB #24058

# FISH AND SHELLFISH PREFERENCES OF HOUSEHOLD CONSUMERS - 1951

## Part I - National Summary

Fishery Leaflet 407, Fish and Shellfish Preferences of Household Consumers--1951 (Part I - National Summary), summarizes for the United States the answers of 2,473 persons to questions asked them in an October 1951 survey about the fish and shellfish preferences of their households. This is the first of a series of summaries on this subject to be issued as fishery leaflets. Subsequent issues will give analyses on a regional basis, rural and urban basis, income basis, etc.

The survey was conducted by the U. S. Fish and Wildlife Service. Field work was done by a private research firm under contract. Fifty-two questions, some with subparts, were asked the respondents. The questions pertained predominantly to their preferences and desires with respect to fresh and frozen fish and shellfish, although canned and cured fish are covered in a few instances. Information is given on frequency of use, such as days served, seasons served, kind served, etc.; preferences of fresh versus frozen fish and shellfish; particular preferences with respect to packaging, grading, cooking, cuts preferred, availability of frozen fish and shellfish; and mail-order business for frozen fish and shellfish. In this initial publication the information is summarized on a national basis.



The work sheets containing the data for this particular survey are arranged so that various types of summaries may be readily obtained. Only those of general interest will be published by the U. S. Fish and Wildlife Service. Anyone interested in studying these work sheets may inspect them in the office of the Branch of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington, D. C.

Free copies of Fishery Leaflet 407 are available from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

Free copies of Fishery Leaflet 407 are available from the Division of Information, U. S. Fish and Wildlife Service, Washington 25, D. C.

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